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110 **BEST WAYS TO BROWSE THE WEB**

REVIEW Everywhere on the Web are thousands of add-ons, plug-ins, and applications that promise to make your browsing better. Here's our take on the best—an offline browser that surveys changes in Web sites while you sleep, an offline newsreader that's your own custom CNN, a search tool that beats online search engines, a file viewer that opens even obscure file formats, and much more.

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COVER *Digital composition by Nick Fain*

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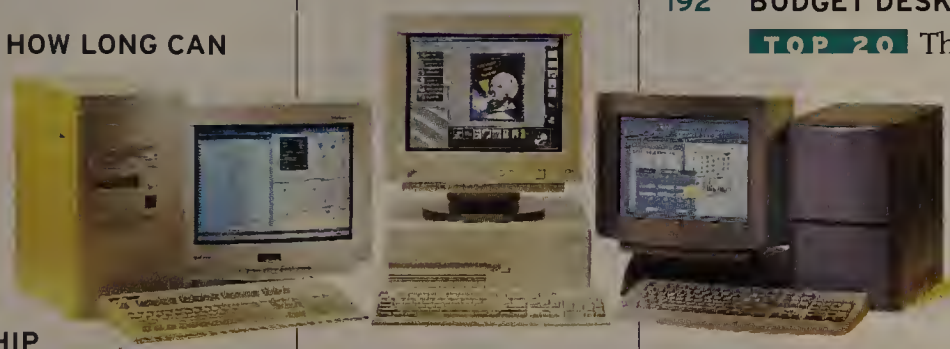

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NETSCAPE COMMUNICATOR 4: TIPS, TRICKS, AND SHORTCUTS

REVIEW So many new features, so little time. We show you 25 ways to make the most of this latest version of Netscape's popular software.
http://www.pcworld.com/apr97/communicator

SURVIVE TAX SEASON WITH A LITTLE HELP FROM THE NET HUNTERS

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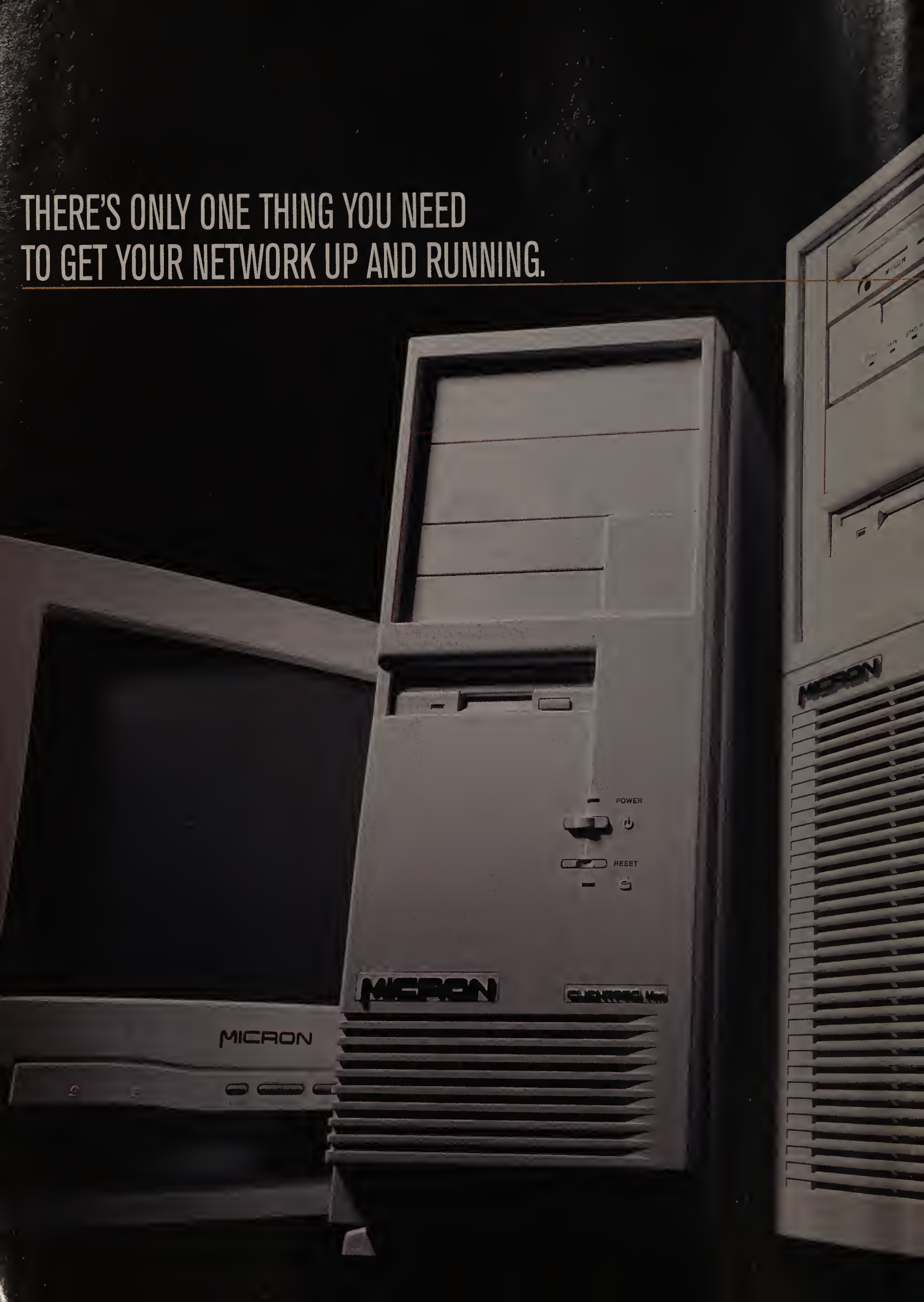

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CONTRIBUTING EDITORS

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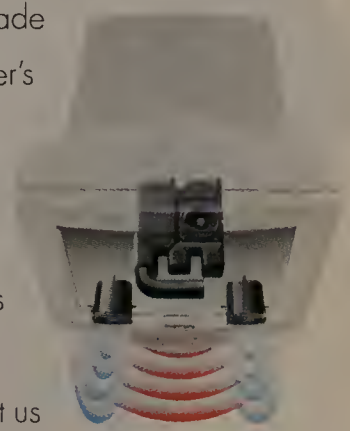
PRESENTING A CONCEPT PREVIOUSLY OVERLOOKED IN MONITOR DESIGN.

Finally, one monitor company has achieved the much anticipated convergence of audio and video: the media-ready series from Nokia.

Behind the sleek tooling, dual powered stereo high/midrange speakers, a deep-tuned sub-woofer waits to shape the richest audio your computer can unleash. As Europe's premiere monitor company, Nokia has created a tuning port architecture housed in the monitor's swivel base which allows complete utility plus maximum aural impact.

These systems extend Nokia's most award-winning line: the X series. Gaze into some of the most ergonomic screens in the world—including the first to meet the new VESA standards for refresh and resolution. Their aperture grill of a mere .25 mm and lavish 15.7" viewing area make the work space simultaneously soothing and exciting. The media-ready series features the first displays to achieve the TCO'95 standard for monitor emissions.

So, if you are preparing to upgrade your monitor—or your computer's audio system—don't overlook these phenomenal displays. They offer a level of superiority you can appreciate even with your eyes closed.



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You Can Be Home Again

THE "PRODUCTIVITY GROWTH" of the 1990s comes at high personal cost. Companies are expected to produce more each year with less, and they expect each white-collar worker to do the same. The result for many professionals is more time working and less with their families. We've known this anecdotally for some time. Morgan Stanley's chief economist, Stephen S. Roach, makes the case more powerfully in the November/December 1996 issue of the *Harvard Business Review.* In an article entitled "The Hollow Ring of the Productivity Revival," Roach writes: "Laptops, cellular phones, wireless modems, and fax machines may change the work environment for many professionals, but they don't alter the thought processes that ultimately lead to breakthroughs. What those tools have done, however, is help to extend the working day." Roach goes on to say, "...generating more output by working longer hours fails the test of meaningful productivity growth." Certainly this kind of increase in productivity can't be sustained: You can only march so far on the road to round-the-clock workdays before hitting a wall.

Whether you find telecommuting an option depends on company policy and local services for the home office.

Productivity growth through longer workdays may be bogus, but all too many business leaders seem proud of it. Where does that leave today's professionals? Many are striving to recapture time at home by doing some work there on a PC. While this helps us increase our *physical* time in the home, doing work on a home computer is no substitute for paying attention to our children and spouses. It won't necessarily help preserve enough of a personal life to keep a family together. No amount of "family-friendly" corporate rhetoric can substitute for lost personal time. No amount of political oratory about "family values" can compensate children for lost parental attention.

COMMUTE TIME RECAPTURED

AS INDIVIDUALS, WE ARE powerless to reverse the economic and social trends that place such strain on our private lives. We simply need more time, something even Einstein couldn't make more of. But there is one place where millions of working Americans find themselves wasting countless hours: in transit between home and office. Lucky commuters waste only an hour a day in transit. The less fortunate waste 3 hours a day or even more. If the average commuter's transit time totals 2 hours a day, freeing those 10 hours a week could make all the difference at home. For many people, telecommuting has become the best hope of turning worthless transit time into priceless family time.

Whether telecommuting is an option for you depends in part on your employer's policies. But it also depends on living in an area that provides the infrastructure and services you need to run a home office. Is telecommuting a real option in your area? Working with the editors of *Money* magazine, whose annual "Best Places to Live in America" has become the most trusted yardstick of livability, Senior Associate Editor Brad Grimes and Executive Editor Daniel Tynan have created a new yardstick to help you assess your prospects for telecommuting. We hope "Best Places to Live and Work" clarifies the issues in your locale. What if your area ranks near the bottom of the list of 300 metropolitan areas? Then we hope the article gives you and your company ammunition to demand improvements from local providers of all kinds of services for the home office.

TOOLS OF THE TELECOMMUTER

TWO THINGS EVERY telecommuter needs: remote access to company data and utilities for getting the most from the Internet. Senior Associate Editor Harry McCracken's review of remote access software compares eight packages that let you transfer files and remotely control an office PC. Choosing software for remote access requires making even more trade-offs than usual with PC products. McCracken lays out your choices clearly in "Remote Control: If You Had This Software, You'd Be Home by Now." You'll find the summaries of pros and cons especially rewarding.

How can you turn a vast, chaotic medium like the Internet into a productive tool rather than a time-consuming distraction? Utilities, utilities, utilities: offline readers and browsers; bookmark managers; search tools; file viewers; virus protection programs; compression programs; encryption tools; child-protection packages; version management tools; online collaboration software; and still more utilities for dealing with a variety of other tasks. If anything can help you get a handle on the amorphous Internet, Peter Scisco's "Best Ways to Browse the Web" is it. "Tips for Better Browsing" and "Plunging Into Plug-Ins" will save time, too.

Phil Lemmons is editorial director of PC World. ■

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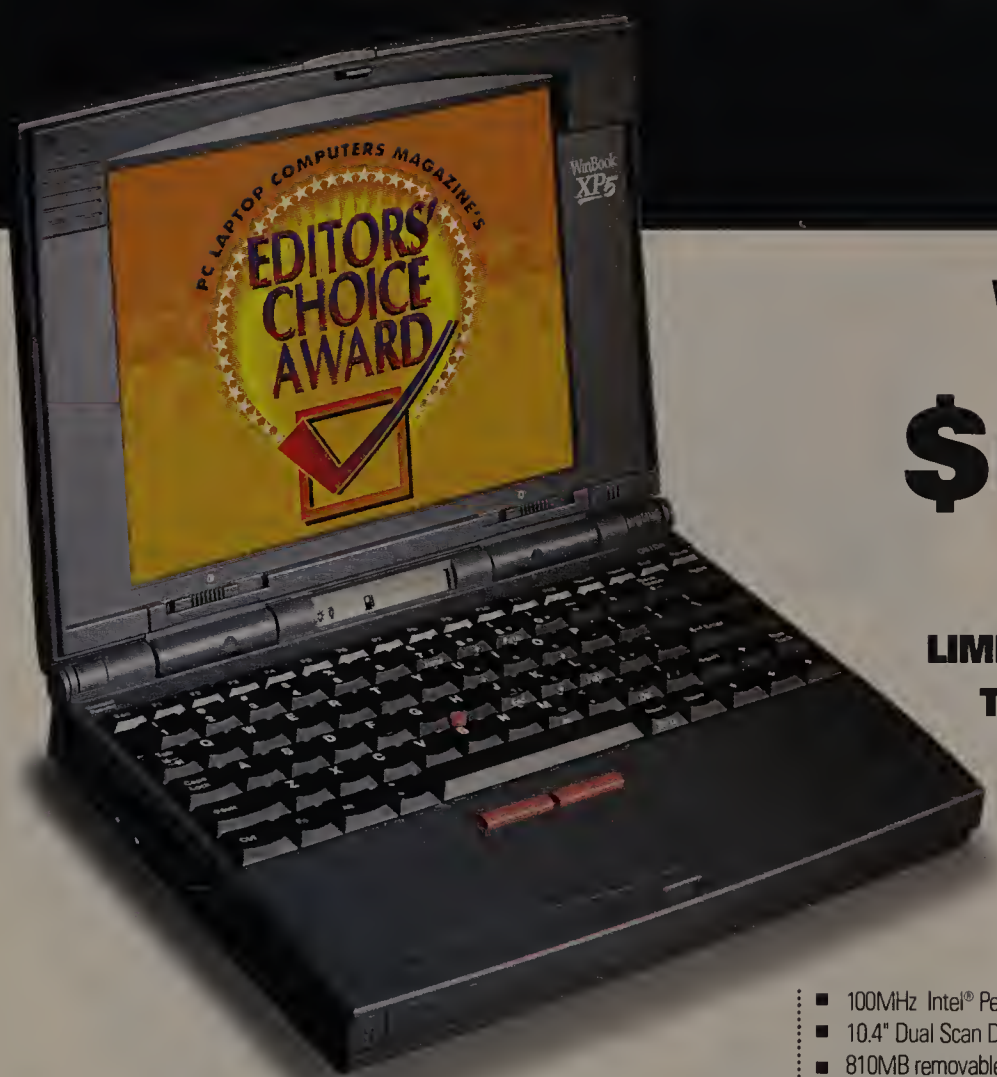

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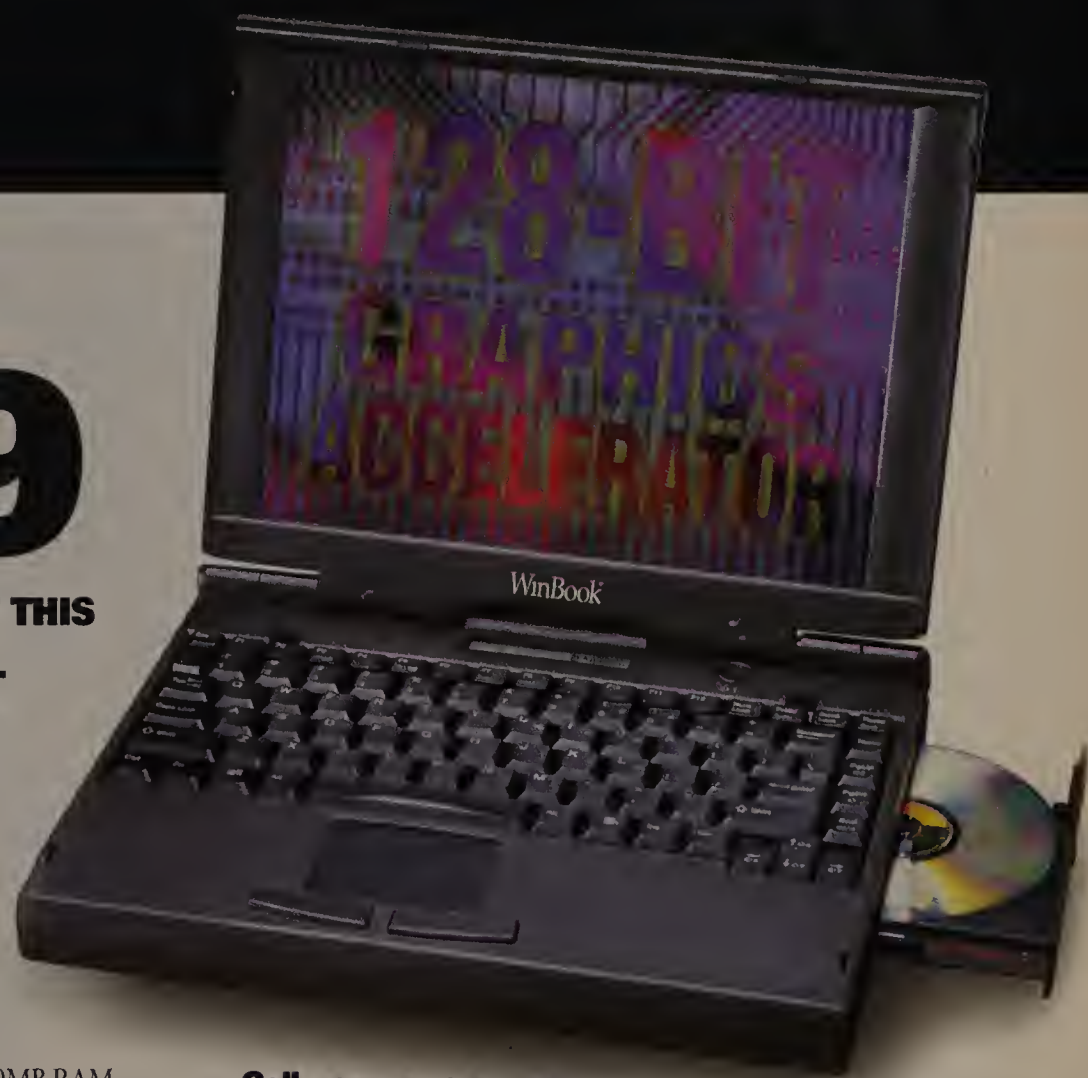

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YOUR TAKE ON: Privacy on the Net ◆ Neighborhood connection ◆ Awaiting 56 kbps

PRIVACY OR PARANOIA?

YOU SHOULD BE ASHAMED for contributing to the privacy paranoia so rampant on the Internet. Suggesting that data compiled from public sources constitutes "a chilling example of just how much personal data can be collected on the Net" is absurd hyperbole. The subject of your article ["No Privacy on the Net," February], Christopher Kantzes, chose to publish to the world his thoughts, comments, and background in various public forums on the Net. The Minneapolis paper collected these tidbits and produced a profile of Kantzes—much as it could have done with one of its readers who regularly writes letters to the editor.

The Net created for Kantzes a previously unavailable opportunity to speak to the world; the Net gave the newspaper a chance to collect his publicly available wisdom. How could his privacy be invaded by a collection of his own public statements?

Tom Koegel, Internet

THE LOCAL ISP

IN "BEST ROUTES TO THE NET," you left out the absolute best kind of provider—the local Internet service provider. In my experience, the smaller companies provide better customer service. I left American Online more than a year ago for an ISP that serves only my local area. I've never had a connection problem, and I've never had to wait for technical support. What impressed me most was that when I e-mailed the ISP's technical support department to make changes to my account, someone from the company actually called to tell me the changes had been made and asked if I needed any more help changing the settings. Now that's what I call service.

Mike Ferguson, Internet

Editor's response: You're absolutely right. Regional service providers often deliver better service than national ISPs. But unfortunately, because there are so many regional ISPs and because *PC World*'s readers come from all over the country, we limited our review to national ISPs. We did, however, take a brief look at the benefits of regional ISPs in a sidebar called "The Friendly Neighborhood ISP." **—Brad Grimes**

PCS @HOME BUT NOT IN TOP 20

IN THE OCTOBER, November, and December 1996 issues, you picked the Compaq Presario 4712 as one of the Top 5 ▶

HOT BUTTON

America Offline: Readers Give AOL an F for Failure to Connect

THIS MONTH WE WERE inundated with e-mail messages and letters regarding February's "Best Routes to the Net: Top Internet Service Providers." America Online was the hardest hit—and since we had to go to press prior to the debut of AOL's flat rate service, we took some hits too. AOL's lack of preparation and failure to provide service to new and existing subscribers had readers downgrading AOL from a D, based on our reader survey, to an F.

IN "BEST ROUTES TO THE NET," you mentioned America Online's adoption of flat rate service, but you missed the problems arising from AOL offering this service without preparing for it. Try hours of busy signals or unanswered calls to local access numbers, Internet access so slow as to be dysfunctional, wait times of 45 minutes for online assistance, or being kicked off the system in the middle of waiting due to 'lack of activity'. AOL's response? It's adding capacity. Its service has gone from D to F-. I am going to help AOL out of this logjam by switching to another online service.

Tom Glassen, Internet

EITHER THIS ARTICLE is outdated or your reviewer lives in another world. The statements "It was easy to log on to AOL" and "Like everything else...getting technical support was easy" are way off base! Here in the real world, we

experience hour-long waits for phone support and constant busy signals when we try to access AOL.

Peter W. Shipp, Jr., Woodstock, Georgia

IT IS OBVIOUS YOU HAVE NOT tried to access America Online recently. In "Best Routes to the Net," you say you had no problems reaching AOL, but I rarely connect on the first try while using two access numbers for higher speed. Many times it takes over an hour before I manage to connect.

Marius Baciu, Sacramento, California

WHILE A MEMBER of America Online, I found it quite irritating that I couldn't get online, yet I was still seeing AOL television ads and receiving disk mailings. I switched to a local service provider last month. Although the local ISP's ease of use is not up to par with AOL's, at least I can connect.

Jeff Longchamp, Dothan, Alabama

YOUR ISP REVIEW MUST HAVE been prepared before America Online introduced the $19.95 unlimited service. AOL users in Phoenix are greeted with 'all circuits are busy' because of the increased usage. Any attempts to connect to the service during prime-time evening hours meet with either a busy indication or the 'all circuits are busy' message on the two local access numbers provided. An F for failure to connect would be the correct grade.

Charles E. Sandhofer, Phoenix

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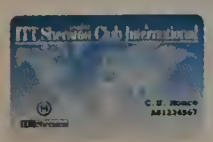

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Circle 113 on reader service card

family PCs. My question is, why wasn't this system rated as one of the budget or power Top 20 computers?

Kenneth W. Butler, Internet

Editor's response: At Compaq's specific request, the Presario 4712 was not covered in the *PC World* Top 20. The company states that its Presario 4712 is a home computer and was not designed to compete with business systems. **–Tracey Capen**

QUICK FIX FOR CYRIX CPU

AFTER A LONG WEEK at school, I went out to buy a new game, and was quite annoyed when it wouldn't play on my computer. I shut down my system in disgust and started reading my February issue of *PC World*. Imagine my delight at finding my very problem discussed in "Bugs and Fixes" ["NT 4.0 Bogs Down on Some Cyrix CPUs"]. I have the early release of Windows 95 that recognizes my Cyrix 6x86 P150+ as a 486. So I downloaded the appropriate patch from Cyrix's Web site, and all is working well now. Thank you for staying up-to-date and keeping me well informed.

Doug Berner, Internet

DISAPPOINTED WITH MCI

IN FEBRUARY'S "Best Routes to the Net," I was surprised by the B+ for MCI Internet. I have been an MCI Internet member for two months and am totally unimpressed with their service. I have spent more than 30 minutes on hold trying to resolve problems with the service, have found their online technical support unhelpful and have yet to receive a response to my e-mail messages. I expected more service from such a major provider.

Josh Nelson, Hanford, California

INTERNET EXPLORER BETA RELEASE

IN YOUR CURRENT ISSUE and on your online site, you compare some features of Netscape Navigator's and Internet Explorer's new betas. I have found Navigator's beta on the Netscape site but cannot locate the IE 4.0 beta that *PC World* said would be out in December.

Kevin W. Waltman, Internet

Editor's response: Microsoft had assured the press that IE 4.0 would be out by year-end 1996, but the latest word is that it will be in beta by early March. **–Yael Li-Ron**

DELIVERING X2

WHY HASN'T YOUR magazine reported on the new 56.6-kbps x2 U.S. Robotics modems? They have been advertised in every major computer publication for the last five months, but I do not know of anyone who has tested, reported on, or even acknowledged the new development. It seems like an earthshaking development with the makings of a great cover story.

James Marasco, North Providence, Rhode Island

Editor's response: USR and other companies have been advertising 56-kbps technology for months but have yet to deliver the product (see February's *Top of the News*). We're doing a big modem roundup in our July issue and will include as many 56-kbps modems as possible. Evaluation units from the major vendors are not expected until early February. **–Eric Hellweg**

PC World *welcomes your responses, ideas and other letters to the editor. See page 14 for contact information.* ■

CORRECTIONS AND CLARIFICATIONS

THE FEBRUARY REVIEW of Internet service providers, "Best Routes to the Net," incorrectly states that MindSpring offers 5MB of Web server space with its $19.95 unlimited access package. MindSpring's hourly rate packages come with 5MB, and its $26.95 unlimited access package comes with 10MB. Nonetheless, MindSpring remains a *PC World* Best Buy on the basis of its overall service and range of features.

In the January *Consumer Watch* column, the name of Micron Electronics' chairman, chief executive officer, and president Joseph M. Daltoso was spelled incorrectly.

In "No Privacy on the Net" February in our February issue, we reported that Wells Fargo Bank is shying away from online banking on the Internet. In fact, Wells Fargo offers a number of secure consumer and merchant banking services on the Web at http://www.wellsfargo.com.

PC World regrets the errors.

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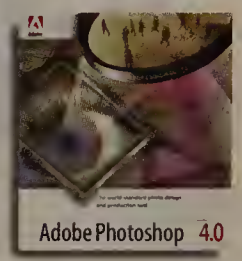

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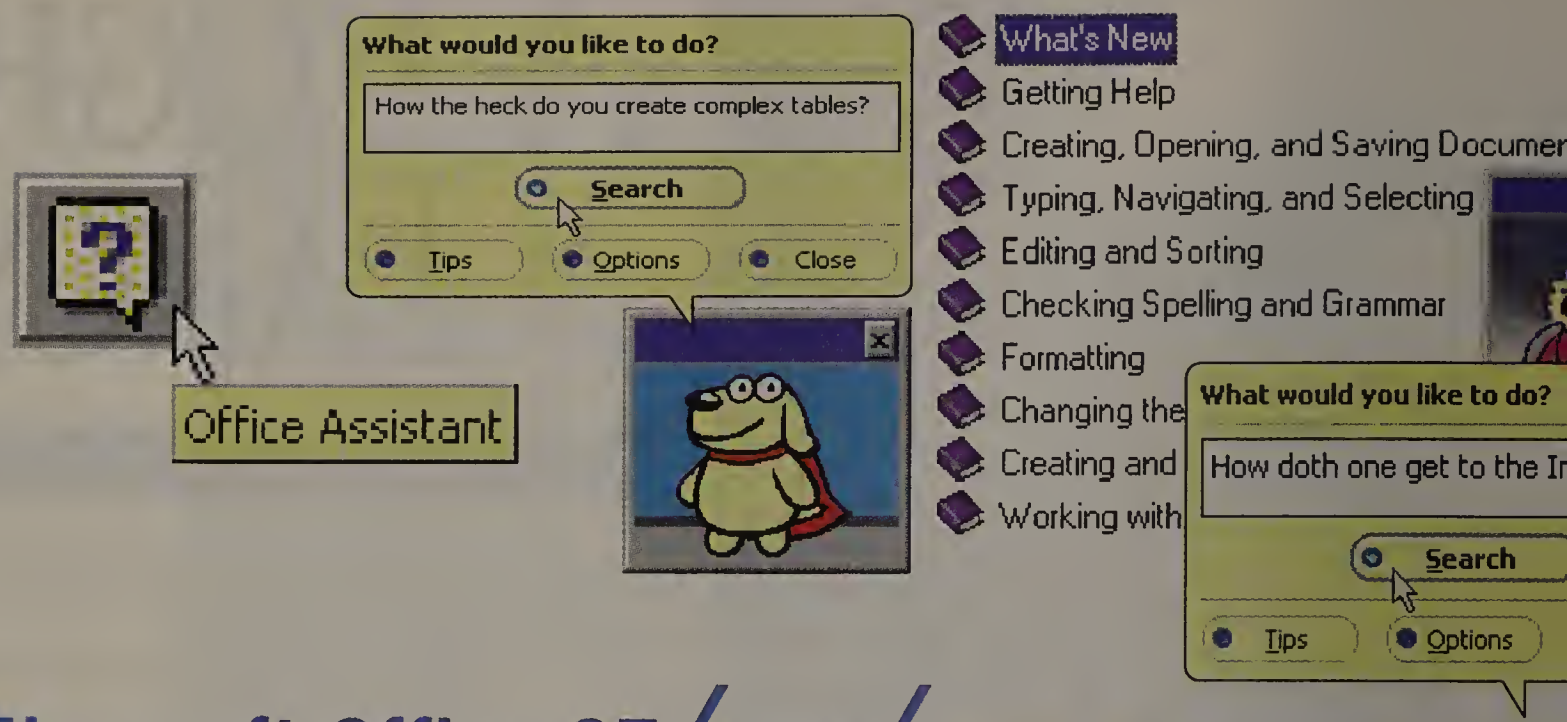

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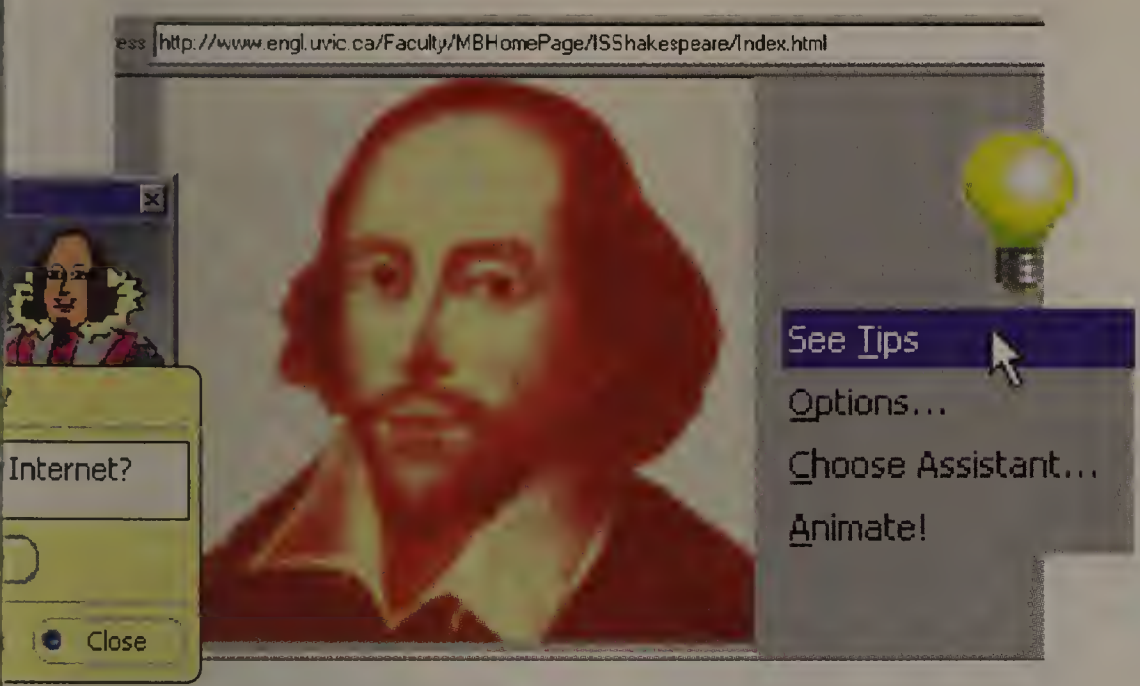

espeare, the little animated dog.

His name is Power Pup, and he's one of the Office Assistants, your personal guides to new Microsoft® Office 97. Office Assistants are designed to help you do things in fewer steps, with better results and less frustration. For instance, if Power Pup sees a shortcut to what you're doing, he'll suggest it. He'll walk you through tasks you need help completing. And you can ask him questions in plain English. There are nine Office Assistants, including the aforementioned bard and pup, a Hoverbot and a sarcastic, slightly bent paper clip. You can customize your helper to offer as much or as little help as you'd like—or you can turn him, her or it off. Microsoft Office 97 has lots of other intelligent improvements, like the overall webbiness, or the automatic correction of formula mistakes in Microsoft Excel. But what may prove invaluable to your mental well-being is that goofy-looking dog. To find out more about the little critters, visit our Web site.

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You've Got Mail, But Do You Want It?

Annoying junk e-mail is flooding our in-boxes. Here's what you can do to get rid of it.

ILLUSTRATION: GEOFF SPEAR

I RECENTLY TOOK a ten-day business trip. When I returned, I was greeted with the dreaded foot-high stack of "personal" mail on the kitchen counter and a mailbox crammed with "business" correspondence at the local post office. I used to dread the task of opening all the piled-up mail, but now I can whip through the stack in no time. The reason? It's almost all junk.

I'm not referring to press releases or even the newsletter from my local trash collection agency. I'm talking about bona fide junk, the stuff I take one look at and toss: offers for new credit cards, discount coupons for take-out pizzas and car washes, and the endless piles of mail-order catalogues.

But as much as I detest paper junk mail, I'm increasingly bombarded with a new form of direct marketing that I dislike even more—junk e-mail. Rarely a day goes by when one of my e-mail boxes isn't crammed with a slew of unwanted solicitations. One day it's about a miracle diet; the next it's a subscription offer for a health letter; and at least a couple of times a week I receive word of a hot new bulk mailing service so I, too, can harass people online with junk mail. Ah, the wonders of technology!

Although the number of junk e-mail messages I receive every day is on the rise, it still doesn't match the volume of paper junk mail I get. But that may be changing. Direct marketers are realizing the beauty of bulk e-mail: It costs next to nothing (the savings on U.S. postage are enormous) and can reach hundreds or thousands of potential customers almost instantly. Some mail is targeted, with e-mail addresses culled from postings on Internet newsgroups and message boards, or from member profiles on online services. I recently received a solicitation for a health newsletter after posting messages to America Online's Health Forum. Other e-mail is just "spammed" to everyone in hopes they might reach a few who care.

THE BIGGEST ONLINE COMPLAINT

JUNK E-MAIL IS THE number one subject of complaints from subscribers, according to America Online spokesperson Andrew Graziani. As a result, last fall AOL instituted PreferredMail, a feature that keeps e-mail from known bulk mailers out of your in-box. PreferredMail is the default for all AOL subscribers, though you can choose to shut it off if you decide you really do want all the junk. At this writing, you can't pick and choose which bulk mailers you want to block. You can, however, choose to shut off the PreferredMail feature and create a custom list of "approved" e-mail addresses. Mail sent from anyone who's not on the list automatically gets blocked.

But AOL subscribers are by no means the only cybernauts plagued by unwanted messages. Anyone with an e-mail address is a potential target. The more active you are in newsgroups or the more frequently you post on message boards, the more likely it is that your in-box will be cluttered with solicitations.

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known bulk e-mail companies and is currently embroiled in lawsuits filed by several online services and Internet service providers. In the first significant court ruling on junk e-mail, Cyber Promotions was dealt a huge blow last November when a judge ruled that the Philadelphia-based company did not have the constitutional right to send out unsolicited e-mail—it was not considered free speech. However, there are no laws prohibiting junk e-mail. Just what junk e-mailers can get away with will depend on the vigilance of ISPs and online services. Some opponents of the practice have attempted to interpret the federal law against junk faxes as also applying to e-mail solicitations; that interpretation has yet to be tested in court.

All the **online services** and many ISPs have instituted policies **forbidding** use of their services for sending **bulk e-mailings.**

Without state or federal laws prohibiting the practice, all the online services and many ISPs have instituted policies forbidding use of their services for sending bulk e-mailings. This is a step in the right direction, but not all ISPs have established these controls—and many of those that have are sometimes unwilling or unable to enforce them.

TAKING OUT THE TRASH

BUT YOU DON'T have to accept junk mail as inevitable. Here's what you can do to cut back on the unwanted mail or eliminate it entirely—depending on how much trouble you're willing to go to.

◆ **Install an e-mail filter.** You'll find several shareware programs on the World Wide Web. Most, like eFilter from TSW (http://catalog.com/tsw/efilter/), an Internet software design firm, allow you to specify keywords that will automatically result in an e-mail message getting deleted before it ever reaches your in-box.

◆ **Remove your name from the list.** Some e-mail solicitations include a return address for having your name removed from that company's mailing lists. Use it. Send a similar request to anyone who sends you junk e-mail. Spam Hater Software from Net Services (http://www.compulink.co.uk/~net-services/spam/) will automatically send such a response. Just don't expect every direct mailer to comply. The Web is full of reports from people whose names were never removed from lists, despite repeated requests.

◆ **Inform the carrier.** Many opponents of junk mail suggest notifying the sender's carrier of the offending message, since many ISPs have policies against bulk e-mailings. Send copies of the message to "postmaster" and "administrator." Even ISPs that don't prohibit junk e-mail will take notice if enough consumers fire back angry messages. Jeff Cartwright, director of communications technology for Planet Access Networks, an Internet solutions company in Stanhope, New Jersey, estimates that one junk e-mail message can result in as many as six new messages entering their system. This can overload it and grind legitimate use to a halt. That's why Planet Access prohibits unsolicited bulk e-mailings—and kicks off any users who break the rule, says Cartwright.

◆ **Use multiple addresses or screen names.** This suggestion comes from David Topping, founder of Outlaw Junk E-Mail Now (http://www.public.asu.edu/~dtopping/ojen.html). When possible—some ISPs don't allow multiple e-mail addresses on one account—use one address or screen name for postings to newsgroups or message boards and another for e-mail correspondence. This will separate the junk mail, so you won't have to read it.

◆ **Track down the sender.** Some junk e-mail comes via remailing services, shielding the senders. But Windows 95–compatible *tracing programs* are available on the Web. These programs log the path over the network on which a message was sent to find its original source. To get a tracer program, do a Web search for "tracerroute." Once you locate the perpetrator, notify the carrier of the unwanted messages.

You probably won't be able to eliminate every piece of junk mail. Unless, of course, you're willing to do what ▶

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Julian Byrne of Melbourne, Australia, did. He installed a filter that kicks back every e-mail message that isn't from his "approved" list of senders. The bounced messages are enclosed in a message containing a keyword that correspondents can put in the subject field to allow their messages to make it through Byrne's filter. It's a hassle for people trying to reach Byrne, but it sure keeps his mailbox trim.

Have you found a way to stop unwanted e-mail? Send an e-mail detailing your strategy to consumerwatch@pcworld.com. Roberta Furger is a PC World *contributing editor and author of a forthcoming book on girls and computing (Warner Books, 1997, 212/522-7200).* ■

SET YOUR SITES

FOUR WAYS TO DUMP JUNK

Want more information on how to control or stop unwanted commercial e-mail? Here's a sampling of sites that can help. For a more detailed listing, run a search for "junk e-mail."

- Get That Spammer (http://kryten.eng.monash.edu.au/gspam.html): A step-by-step guide to deciphering return addresses and routing information so you can identify senders of junk e-mail and their service providers. There's also a detailed discussion of what ISPs can do to reduce such mailings.
- How to Get Rid of Junk Mail, Spam, and Telemarketers (http://www.csn.net/~felbel/jnkmail.html): Lots of tips for dealing with junk mail of all types, as well as information about how to remove your name from mailing lists.
- Net Abuse FAQ (http://www.cybernothing.org/faqs/net-abuse-faq.html): The complete guide to Internet abuse, from junk e-mail and spamming to information on joining and accessing news.admin.net-abuse, an extremely useful newsgroup dealing with all aspects of the issue.
- O.J.E.N.—Outlaw Junk E-mail Now! (http://www.public.asu.edu/~dtopping/ojen.html): David Topping, the author of this site, advocates federal regulations prohibiting junk e-mail. There are also many links to other sites covering various aspects of the junk e-mail problem.

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56i	15" FST (13.6" VIS)	.28mm dot	1024x768 @ 80 Hz NI
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3 YEAR LIMITED WARRANTY

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Damaged in transit ◆ No help for free ◆ Speedy repairs

DAMAGED GOODS

I WAS HAVING TROUBLE getting my under-warranty Midwest Micro computer to boot up. So I shipped it back to the company via UPS for repair, insuring it for $1000. Even though I packaged it correctly, it arrived damaged. Midwest Micro returned the computer to me with damaged CD-ROM, floppy, and tape drives, saying I had to contact UPS to get it repaired. After weeks of filing claims with UPS, I finally arranged for a representative to come and inspect the computer. He told me that UPS would reimburse me for the damage. Fine. But now Midwest Micro tells me that because my computer was damaged (not by them), my warranty is voided.

Jijo Varghese, New York

Editor's response: We spoke with Dan Burchett, Midwest Micro's assistant customer relations manager. He confirmed that Varghese's computer had been damaged during shipment. According to company procedure the computer was returned to Varghese to process repairs and insurance with UPS. UPS's policy on goods damaged in transit is clear: If you package your system correctly, UPS will cover any damage. If you use inferior packaging, UPS won't. (For more information about packaging, see http://www.ups.com.) As for Varghese's warranty, Burchett told us that Midwest Micro would certainly honor it. The company has fixed the system's original problem by replacing the motherboard.

NO CREDIT, NO COUNSEL

I RECENTLY PURCHASED a Compaq 8702 computer and 1725 monitor. When I tried to access help, I got a general protection fault. So I called technical support. The technician asked for a credit card number but assured me I wouldn't be charged if the problem was due to a defect in the computer. After a long phone consultation, the problem was fixed—at no charge. But new problems cropped up. During the repair, the technician had told me to delete some files. Now, the computer was asking for disks I didn't have because the computer didn't come with copies of the installed software. I called technical support again. A technician offered to send the disks right away, but she would have to charge me $35 for them, since the problem I had originally called about had been fixed. She said if I wanted to dispute the charge, I had to send the company a fax. I sent a fax but haven't heard anything since.

Tom Hontz, Phoenix

Editor's response: We received several complaints from people who felt they'd been wrongly charged by Compaq technical support. Compaq charges $35 per question for any computer problem that doesn't involve a defect with the PC (see "PC Reliability and Service: Good-Bye to Good Support?" in the December 1996 issue), but the tech support representative decides whether you have to pay. What do you do if you feel you were charged in error? Call or fax tech support and ask to have the charge reversed. The technician will investigate to determine whether the charge was legitimate. Sometimes, as in Hontz's case, this may take a week to research. And it may take one to two credit card billing cycles to remove the charge. Hontz got his $35 back. He also got his disks. But he didn't get over the incident—he tells us he'll never buy another Compaq.

REMOTE SERVICE

PUT EPSON AMERICA on your list of outstanding service providers! Last week my Stylus Color II printer developed a bug. I called Epson and they gave me immediate, comprehensive shipping instructions. UPS picked up my printer at about 4:30 on Monday afternoon and returned it, completely healed, at 4:30 p.m. Wednesday. This might not be so astounding except that I live in the backwoods of Mississippi, ten miles to the nearest village and half a mile to a blacktop road. And Epson paid the shipping costs both ways. You can't match that for service.

Henry Wise, Leakesville, Mississippi

Think you've gotten a raw deal—or a great one? PCW Advocate *wants to hear the details at advocate@pcworld.com. We'll investigate complaints and publish items of the broadest interest. Christina Wood is senior @Home editor for* PC World. ■

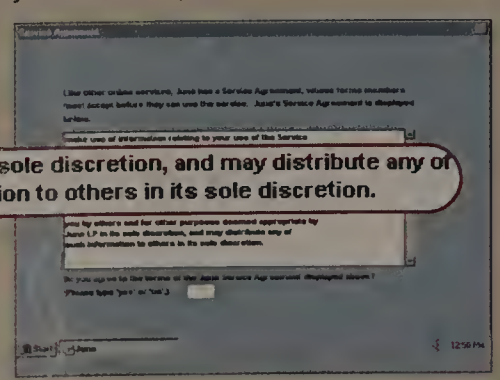
ILLUSTRATION: JOHN CUNEO

THE FINE PRINT

SELLING YOUR PRIVACY?

YOU CAN GET "free" e-mail from Juno if you answer detailed questions about your income and habits and then look at ads while reading your e-mail. In the FAQ section of its Web site, Juno states that it never shares personal information without permission. But the fine print in Juno's (since changed) service agreement gave the company the right to sell it. Then the New York attorney general's office noticed the disparity and asked Juno to clarify its policies. In November 1996 Juno altered its service agreement. "Our policy has always been to protect members' privacy. The clarification was to make this explicit," says Charles Ardai, Juno president.

When you give personal information away, be sure you don't sell your right to privacy with it.



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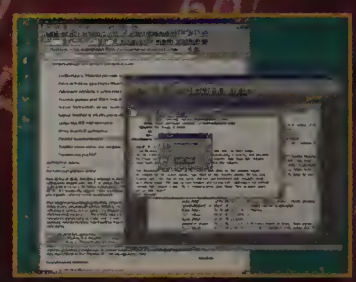
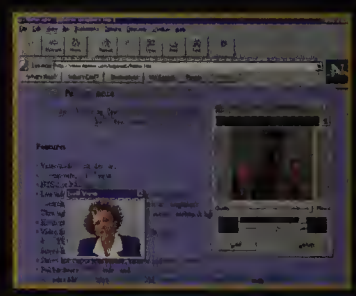


High resolution workflow

3D web browsing



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* Estimated street price for 2 MB. All performance tests conducted by Matrox Graphics Inc. on a MMX 200Mhz system with 32MB of EDO DRAM and 256K of cache. WinBench 97 Business Graphics conducted at 1024x768@8bit with 75Hz vertical refresh under Microsoft Windows 95. Matrox Mystique, ATI 3D Xpression + PC2TV, Diamond Stealth 3D 2000XL and STB Velocity 3D were configured with 4MB of memory for the PCI bus using driver release 3.30, 3.03, 4.04.00.2104 and 1.24B respectively. Microsoft Tunnel test run at full screen 640 x 400 resolution with 16-bit color at default manufacturer refresh rate based on Gouraud shading, perspective correct textures, point sampled and z-buffer.

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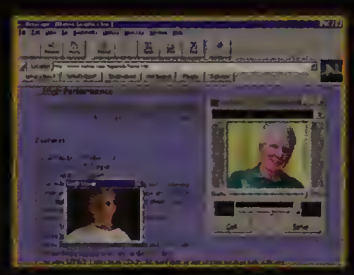
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* Estimated street price. ** Software bundle available only with retail product. Rainbow Runner products can only be used in conjunction with Matrox Mystique. 1 Watching TV on the PC requires Matrox Rainbow Runner TV (sold separately) or a VCR in addition to Matrox Rainbow Runner Studio.2 Video conferencing software included. 3. Price quoted is for 4 MB version. All prices accurate at time of printing. VDOnet is a registered trademark of the VDOnet corporation.

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Circle 184 on reader service card

How Do You Work Without Your Hands?

Voice recognition software made it possible for Brae Landon to keep working and go on with life—despite a debilitating computer-related repetitive strain injury.

PHOTOGRAPH: JAMES ARONOVSKY

THE PROBLEM BRAE LANDON was a successful computer animator, a profession she had enjoyed for more than 15 years. But with only scant warning, the long hours she worked at her PC took a steep physical toll: Landon suddenly couldn't use her hands without experiencing extreme pain. Technology threatened not only her health but her career as well. Could technology, in the form of voice recognition software, now allow her to keep working and living an active life? —*Editor*

IT WAS ABOUT 6 P.M. I was working under a tight deadline, and I figured it was going to be another late night. Then suddenly as I reached for my mouse, I felt a sharp, searing pain. It was as if a hot poker had touched my right forearm.

I'd had some discomfort before that night. At the time—August 1994—I was an animator for NTN Communications in Carlsbad, California, which produces interactive games and broadcasts them to clubs and lounges. Many of my projects required lots of mouse work, which occasionally left me uncomfortable. I thought any discomfort I felt was fatigue. But this time the pain was different. I tried to keep working, but I couldn't.

The next day my arm still hurt. Over the next several days, my right hand swelled. I couldn't make a fist anymore. I didn't know what was going on or what to do. I did know that something was seriously wrong with my body.

Before long, I had injured both arms and hands. Over the next six months, I kept working in a modified state. The injury was no longer impacting only my work, it was affecting my whole life. Routine tasks such as combing my hair, brushing my teeth, and dialing the phone were painful. My condition had worsened into radial tunnel syndrome and the radial nerve in my forearm was chronically inflamed.

I turned to Workers' Compensation for help: I went into physical therapy and began taking anti-inflammatory medicine. My doctor said the only chance I had to get better would be to stop working for an extended period.

THE SOLUTION: TALK TO THE PC

DURING A SIX-MONTH disability leave, I worked with Workers' Comp Vocational Rehabilitation to prepare myself to reenter the job market. One of the tools I heard about in the program—speech recognition software—was to become an invaluable tool.

I had to admit that I couldn't return to producing animation. I felt my best chance was to return to NTN Communications, where I had a track record. I checked to see if there were any openings in the training department, where I wouldn't have to use the computer all day and could apply some of my skills. They were looking for a training specialist; I was hired.

One of my responsibilities in this job is to create training manuals. While I have an assistant, this task still requires a fair amount of computer work, using applications such as ▶

Microsoft Word and PowerPoint.

I decided to give speech recognition software a serious try. These programs let you execute commands, input text, and perform tasks on your computer by speaking into a microphone instead of typing or clicking a mouse. I began using Dragon Systems' DragonDictate program in conjunction with Word and PowerPoint so I could create the training manuals without relying too much on someone else's help. I also used DragonDictate for e-mail and getting onto the Internet.

Speech recognition software translates speech into commands or text the computer can understand. You must train it to understand your speech; this operation is an ongoing process. You must speak slowly and distinctly when dictating text, pausing after each word, so the program will recognize and enter the word properly. If you don't stop and correct the software when it misenters a word, it will continue to make the same mistake. Before my injury, I could type about 100 words per minute. With speech recognition software, I initially could enter only about 20 words per minute; now I'm up to about 30. The more you train the software, the faster it gets at recognizing what you say.

Another benefit to speech recognition software is multitasking. For example, I can file papers while telling my PC to open, save, or print a file. Most important, this technology lets me allocate the 2 hours of pain-free hand use I have each day to tasks other than typing. Without speech recognition software, I simply couldn't continue to do my job and have much of a life outside of work, too.

—Edited by James A. Martin

• DragonDictate Classic Edition 2.5 $695; Dragon Systems; 617/965-5200, http://www.dragonsys.com

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James A. Martin is a PC World *contributing editor. If you use PCs for management in your business, we want to hear from you. We pay $300 for published columns. See page 14 for contact information.* ■

Handy Resources

BOOKS One of the most complete resources is this classic work on the subject, the practical and easily understandable *Repetitive Strain Injury: A Computer User's Guide* (John Wiley & Sons, 1994, 212/850-6000, $15.95) by Emil Pascarelli, M.D., and Deborah Quilter.

SOFTWARE Dragon Systems offers a range of programs, from its top-of-the-line package DragonDictate Power Edition 2.5 ($1695 list) to versions that work with only one application but cost just $99. IBM (800/825-5263, http://www.software.ibm.com/is/voicetype/) offers VoiceType 3.0 for Windows 95 ($699 list). Kurzweil Applied Intelligence (617/893-5151, http://www.kurzweil.com) offers Kurzweil Voice for Windows 2.5 in both a professional edition ($595 list) and a personal version ($295 list), in addition to Kurzweil VoicePad Pro for Windows 1.0 ($79.95 list), a voice recognition word processing program.

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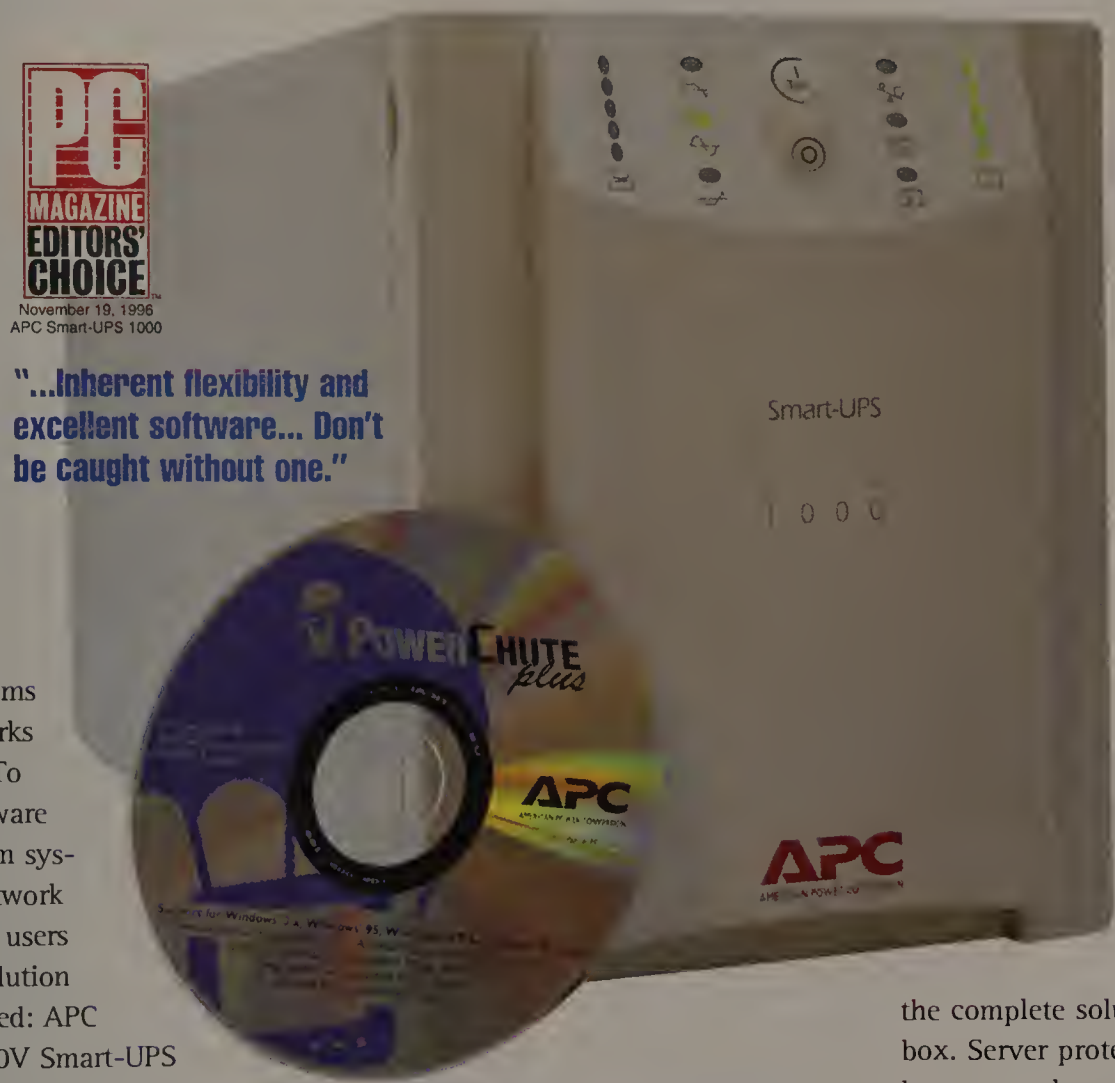

PC MAGAZINE EDITORS' CHOICE
November 19, 1996
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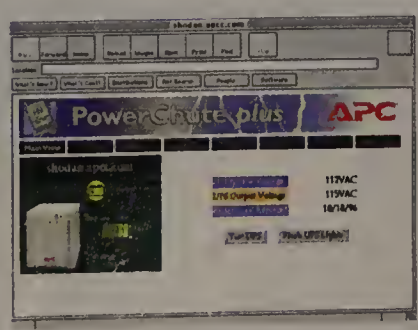

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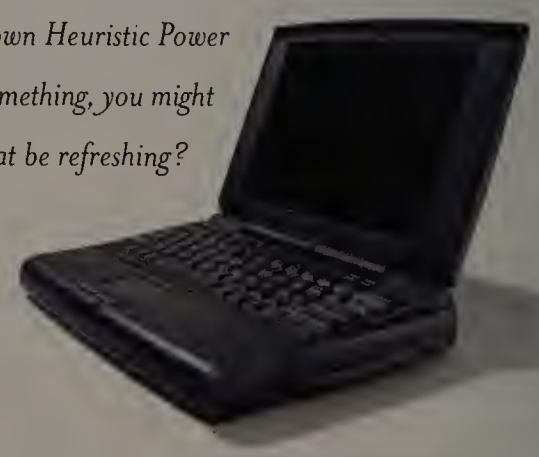
Microsoft Windows® 95 IrDA Device Driver Version 2.0 (included). IrDA adapter for computer required.

WITH seven hours of battery life, the AcerNote Nuovo makes other portables suddenly seem not so portable.

The AcerNote™ Nuovo™ has a single battery that lasts for over seven hours, making it pretty much the only portable that truly stays portable. Besides offering the longest battery life of any notebook, the Nuovo also has a Pentium® processor with MMX™ technology and Acer's own Heuristic Power Management. So whenever you open a Nuovo to work on something, you might actually—believe it or not—be able to finish it. Wouldn't that be refreshing?*



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Norton messes cleaned ◆ FAT32 partitions not quite magic ◆ Bugs and taxes

Norton Utilities 2.0 Comes of Age

THERE'S A FREE UPDATE to Norton Utilities 2.0 for Windows 95 that fixes a score of irritating but nonlethal problems: Among other things, it cleans up messes left by earlier installations, corrects inaccurate free-disk-space readings, reports on FAT32 partitions, stops memory leaks during directory scans, and fixes problems with Windows swap files.

If you run Norton's System Doctor regularly, the program's LiveUpdate feature may have already performed the upgrade for you (with your permission, of course). If not, or if you didn't give permission when you were asked, you can upgrade Norton Utilities by downloading the 575K self-extracting patch file nu20ptch.exe from Symantec's Web site at http://www.symantec.com/techsupp/ftp/nutilftp.html.

PARTITIONMAGIC 3.02

BUG When version 3.0 of PowerQuest's PartitionMagic hard disk partitioning utility debuted at the end of 1996, it gave users the ability to resize partitions based on the FAT32 and NTFS file systems that come with Windows 95 OEM Service Release 2 and Windows NT, respectively. The program also can convert partitions from one file system to another.

Unfortunately, the initial release's NTFS resize feature contains a defect that may make an NTFS partition impossible to boot. What's more, PartitionMagic mistakenly detects FAT32 support in recent Windows NT installations. If you inadvertently convert an NT partition to FAT32, NT won't be able to access it. PowerQuest says it isn't aware of anyone losing data due to these problems, but the company wants to hear from anyone who has; you can contact PowerQuest's customer support at 801/226-6834 or by e-mail at support@powerquest.com.

FIX PartitionMagic Version 3.02 is an all-around fix that is available from the company's World Wide Web site (http://www.powerquest.com/download/update3.html). You'll have your choice of four patches, depending on your operating system and what version of PartitionMagic 3.*x* you have—to find out, choose *Help•About* in the program's interface.

ICON: JEFFREY PELO

IN BRIEF

NT 4.0 Service Pack 2 and More

ANOTHER WINDOWS NT Service Pack? The latest incorporates the post-Service Pack 1 fixes described in last month's column plus more than 100 others. You'll find it at ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/ussp2/i386/SP2_4001.EXE. For fixes to problems that Microsoft discovered after releasing Service Pack 2, go to ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/hotfixes-postSP2/.

Quicken Family Lawyer 7.0

THE 16-BIT, floppy-disk version of Parsons Technologies' barrister-in-a-box won't completely install under Win 95, or under Windows 3.1 if you have the Win32s extensions installed. The fix is at http://www.parsonstech.com/support/news/hotnews.html; look for mfcoleui.exe.

THE MOST TAXING OF BUGS

BUG It's April, and you know what that means—that's right, the inevitable round of tax software bugs. Let's start with the floppy-disk edition of TurboTax 1040 version 96.01. Users may have problems launching the included Intuit Edition of the Netscape Navigator browser.

FIX Intuit says you can avoid problems by launching the browser from within TurboTax itself by selecting *Other•TurboTax Web Site*. Or you can download a patch from http://www.intuit.com/turbotax/support/1996/supdoc96/1273a.html.

BUG Another popular tax program, Block Financial's Kiplinger TaxCut 1996, suffers from a few glitches of its own. Electronic filers can't enter a 1997 date in the 'Date of Filing' field, some Virginia residents can't file electronically, 1099-R calculations go awry in rare circumstances, and more.

FIX For details, workarounds, and a 150K version 1.1 update that fixes all the known problems, visit the TaxCut Web site at http://www.conductor.com/software/techsupp.htm#kpu, or forums on America Online (keyword taxcut) or CompuServe forums (go taxcut).

THE ENHANCED ENHANCED CU-SEEME 2.1

THERE'S A MINOR REVISION available for White Pine's souped-up commercial version of Cornell University's Internet video conferencing program. Version 2.1.1 fixes several problems involving multicast conferencing and video freezing, and adds support for the Motion JPEG video algorithm. If you have the patience, you can download the entire program (6MB for Windows 95, 5.5MB for Windows 3.1) from http://goliath.wpine.com/cu21-upgrade.html.

Scott Spanbauer is a contributing editor for PC World. ■

BUG [illegible]

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– PC WORLD, December, 1996 –

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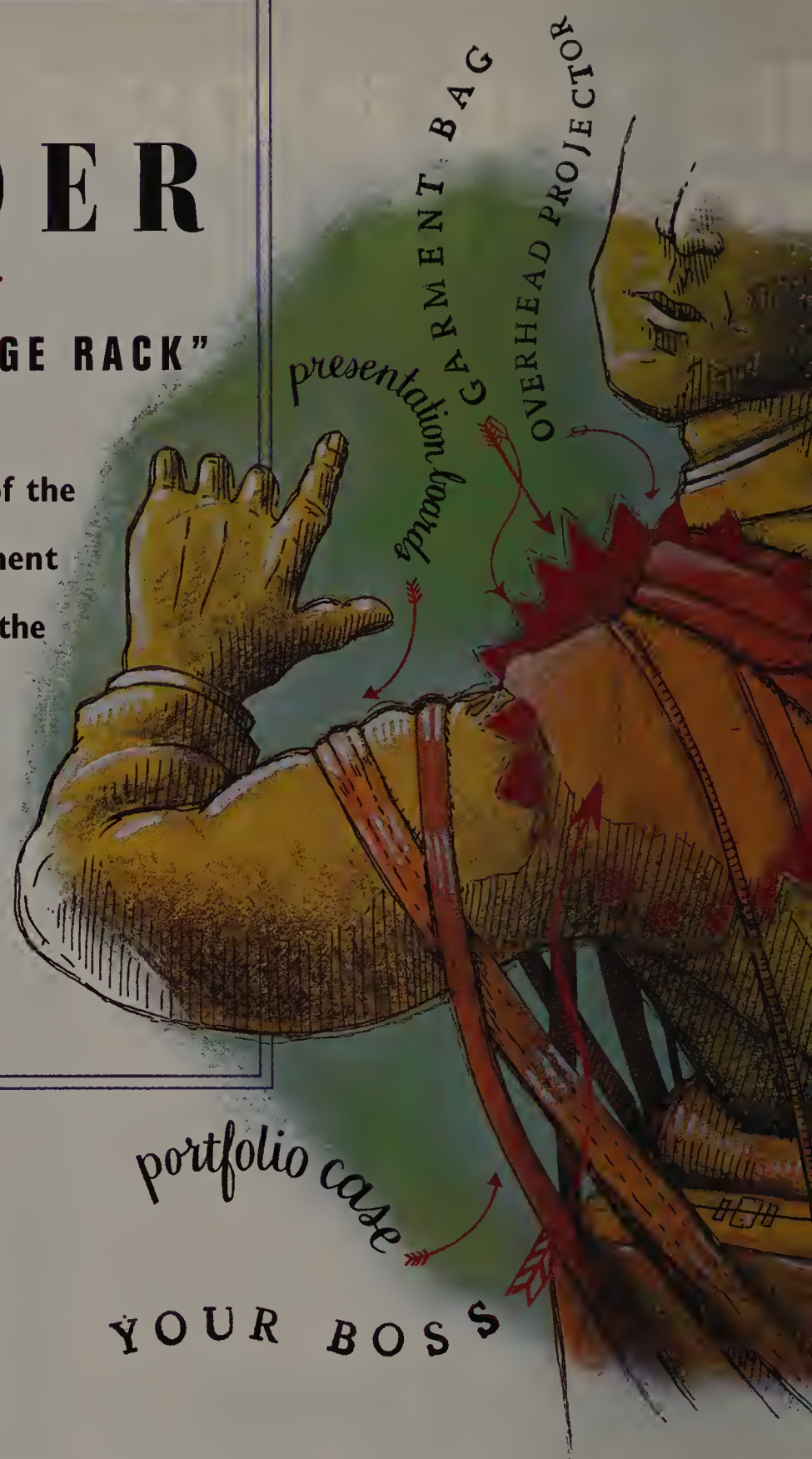

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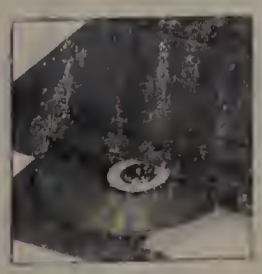

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TOP OF THE NEWS

Software Speed-Ups:

Bold Claims and Dubious Promises

CD-ROM enhancers deliver improvements, but the latest **RAM** and **hard drive accelerators** rarely meet expectations.

Burn Rubber!!!

YOU'VE PROBABLY seen the boxes at your local computer store: Windows 95 utilities that claim incredible performance gains for your PC. The packages feature bold promises in prominent type, with phrases like "Makes your hard drive up to 496% faster" and "Now you can load and run programs faster." Can these claims possibly be true?

Don't count on it. *PC World* took a close look at eight acceleration utilities for Windows 95 PCs and found that the products frequently failed to meet the claims displayed on their boxes. In fact, several products did not provide any discernible performance improvement in our tests, and in some operations, system performance even slowed.

Not that these products are high-tech snake oil. We found that under the right conditions, acceleration software can improve system performance significantly. But to achieve the advertised benefits, users must work with specific types of applications and documents under optimal system configurations.

We examined four CD-ROM accelerators, three RAM enhancers, and one hard disk accelerator. The products seek to improve performance under Windows 95 by tweaking access to storage devices and managing system resources.

OUR FINDINGS

WE TESTED the products by performing typical tasks under common applications such as Word, Excel, and Picture Publisher.

In our tests, only CD-ROM accelerators delivered significant gains, with all four products boosting overall performance by 50 percent or more. These utilities set up a cache of CD-ROM data on the hard disk, providing quicker access and higher throughput on selected data than a CD-ROM drive can deliver. While these products often fell short of their published claims, the improvements we saw in file access times and some disc search tests make them a viable alternative to a new CD-ROM drive.

Using a Pentium-166 system with a 6X CD-ROM drive and 16MB of RAM, we tested Acceleration Software's d-Time95, Micro Design International's CD-ROM Express, Quarterdeck's Speedy ROM, and Syncronys Softcorp's CD Speedster. We ran each product three times through application tasks that stress the CD-ROM drive, including database searches and image loads. To give the products a chance to cache data to the hard disk, we did not include results of the first pass in our calculations.

On the whole, there were sig- ▶

EDITED BY
Charles Piller and Randy Ross

JUST IN

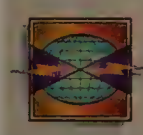
HP's Hot New Handheld

In May Hewlett-Packard expects to ship a $699 Windows CE palmtop featuring a 640-by-240-pixel screen, the highest resolution available in this form factor. The 7.2-by-3.7-inch handheld PC weighs 15.5 ounces with batteries and boasts one of the largest keyboards in its class. The device comes with 4MB of RAM, a Type II PC Card slot, and a Compact Flash Card slot for additional memory. Also included are a docking cradle, a serial interface, and an IrDA-standard infrared transmitter/receiver.

Kodak Unveils USB-Based Camera

Eastman Kodak has announced a camera that sports a Universal Serial Bus connector. The DVC 300 Digital Video Camera is designed primarily for videoconferencing but can also capture still images. At a street price of only $200, it should open color videoconferencing to many home and small-office users. The DVC 300 includes simple editing software for still images. However, the camera is not very mobile; it must stay tethered to your computer because it has no batteries or AC adapter. All its power comes from the high-speed USB port, which is expected to gradually replace ▶

INTERNET



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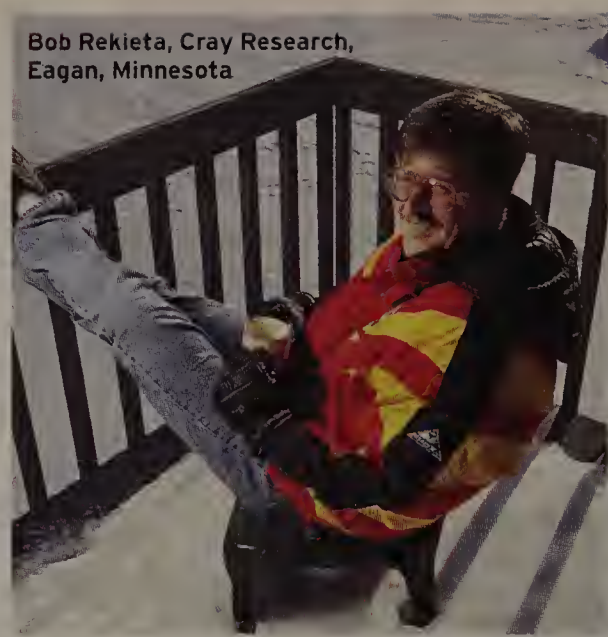
nificant gains nearly across the board. Macromedia Director improved an average of 150 percent, while our Microsoft Encarta script and Corel photoCD Lab slide show improved an average of about 50 and 25 percent, respectively. Products fared less well in the PhoneDisc database search: CD-ROM Express actually slowed searches by 15 percent. CD Speedster eked out a 5 percent gain. We also performed an informal application install test and found the process ran an average of 8 percent slower with the caches than without.

CD-ROM accelerators did help, but didn't live up to their billing. CD-ROM Express, the most able performer overall, promises "the performance of a 10X or 20X drive from a CD-ROM with a 1X, 2X, 4X or faster transfer rate." We saw this degree of improvement in only one test. d-Time95, with a 52 percent improvement,


Bob Rekieta, Cray Research, Eagan, Minnesota

MagnaRAM 97 didn't do what he hoped it would—it slowed application load times.

boasts that it will make your "CD-ROM as fast as your hard disk." Our test results don't support the claims.

Myles Lawrence, Syncronys's vice president of engineering, acknowledges performance can vary, based on the amount of RAM that you have and on your CD-ROM drive's speed; slower drives receive a bigger boost. "We assumed a 4X [spin rate] because [it] was typical at the time the product hit the street," Lawrence says.

These products typically need 20MB or 40MB of your hard disk dedicated to the cache, with further space often required for multiple CD-ROM titles. But older systems with slow CD-ROM drives often lack spare disk space, making the purchase of an inexpensive 8X or 12X drive a better option.

NO ENHANCEMENTS

THE PICTURE is murkier with memory enhancers. As we found in tests late last year, these packages speed up some tasks and slow down others. The best products posted only modest gains in our tests on a Pentium-90 system with 16MB of RAM. We tested the latest versions of Connectix's Agent and Helix's Hurricane, both of which featured changes to their compression routines. We also retested Quarterdeck's MagnaRAM 97, reviewed in January's *Top of the News*.

Agent 97 turned in the best overall performance. Its moderate 7 percent gain is due mainly to its ability to accelerate pasting an Excel chart into Word and rotating a TIFF image in Picture Publisher. Word and Excel application launches improved marginally, though loading files in Picture Publisher slowed margin-

Scrutinizing Vendor Claims

Though relatively inexpensive, some products may not be worth buying.

CD-ROM ACCELERATORS	Street price	What vendors say	What we saw
Acceleration Software d-Time95 800/754-1128 http://www.accelerationsw.com	$50	"...makes your CD-ROM drive up to 30 times faster. This means smoother game play and shorter search times."	Even the product's best test results can't live up to the manufacturer's billing.
Micro Design Int'l CD-ROM Express 800/228-0891 ext. 111 http://www.mdi.com	$40	"...gives you the performance of a 10X or 20X...from a ...drive with a 1X, 2X, 4X, or faster transfer rate..."	The top overall CD-ROM performance accelerator, but it was inconsistent on our search tests.
Quarterdeck Speedy ROM 800/354-3222 http://www.quarterdeck.com	$39	"Increase CD-ROM performance dramatically...Typical gains vary between 11 and 92%."	Inconsistent performance. Sometimes test results met claims, sometimes they did not.
Syncronys Softcorp CD Speedster 888/777-5600 http://www.syncronys.com	$25	"...performance you can see and measure. Load your... programs faster. Make your CD searches sizzle..."	Some sizzle, some sputter, but test results indicate least-dramatic overall improvement.
MEMORY ENHANCERS			
Connectix Agent 97 800/950-5880 http://www.connectix.com	$60	"...real time performance diagnostic that helps you work smarter, faster and more efficiently with Windows 95."	Improved performance significantly in graphics tests but slowed down file loading.
Helix Hurricane 2.03 800/451-0551 http://www.helixsoftware.com	$40	"...continues to provide performance improvement even if you have lots of RAM and a fast CPU."	Product disappointed on launch-application and load-file tests on 16MB machine.
Quarterdeck MagnaRAM 97 800/354-3222 http://www.quarterdeck.com	$39	"...snappier overall performance...slash the time it takes to load...32-bit applications in Windows 95 by up to 40%."	Overall performance improvement negligible. Apps launched an average 14 percent faster.
HARD DISK ACCELERATOR			
Acceleration Software SuperFassst 1.1 800/754-1128 http://www.accelerationsw.com	$50	"...speeds up your hard drive by up to 496%."	Launched programs fast—increases averaged 27 percent—but manipulation of graphics was slow.

PHOTOGRAPH: STEVE WOIT

ally. Ironically, Agent 97's packaging featured the fewest performance claims.

MagnaRAM 97 claims to slash application launch times by up to 40 percent but fell short in our tests. On average, it improved application launch times by 14 percent—by far the best in the group—but well short of the claimed performance. Worse still, MagnaRAM actually slowed most of our file loading and graphic manipulation tasks, resulting in a net overall gain of just 1 percent. The program struggled when opening a TIFF image in Picture Publisher and inserting the same image in a Word file, slowing down our system by nearly 12 percent in each task.

Helix Hurricane boosted overall performance by nearly 3 percent, thanks largely to a big speed boost when rotating our TIFF image in Picture Publisher. But the program actually slowed 6 of our 9 tasks, while posting a slight net performance gain in loading applications.

Helix president Mike Silo says the performance degradation could be caused by our 16MB test system. "We've got tools that help you when you have a lot of memory, [and] tools that help when you are low on memory. But they can squeeze each other when you hit [amounts of memory] in between." Most Windows 95 desktops sold last year shipped with 16MB of RAM.

COMPRESSION CAUTION

FILE COMPRESSION might also affect performance, explains Quarterdeck product manager Gary Sevounts. If MagnaRAM has to compress small files frequently, it may not be as effective, he says. Sevounts adds that compressed image files, such as those in TIFF and JPEG format, can slow performance since the utilities spend time trying to compress data that's already been compressed. Our tests included three operations with TIFF images—MagnaRAM did poorly on these tests.

The vendors say that aggressive multitasking and prolonged use of applications can help performance. But in the multitasked Excel portion of our tests, Agent 97 and MagnaRAM 97 yielded slight performance gains, while Hurricane hurt performance by approximately 4 percent.

The hard disk acceleration product that we tested, Acceleration Software's SuperFassst 1.1, has real, if limited, benefits. While we saw a 12 percent overall gain in our tests, application launch times improved by nearly 27 percent. But the results come nowhere near Acceleration Software's claim that SuperFassst 1.1 "makes your hard disk up to 496% faster." And the impact on other tasks was nearly negligible.

What's the basis for such claims? A best-case scenario. "A 500 percent improvement is the most extreme improvement you can possibly see," says Daniel Kerber, Acceleration spokesperson. "Those tests were done on Pentium Pro machines under very heavy multitasking environments. [When] launching an application, you are only going to see a 50 or 60 percent enhancement."

At press time, Acceleration Software announced it had licensed the SuperFassst technology to Syncronys, for sale under the name Windrenalin. Acceleration Software will continue to sell SuperFassst.

PLACEBO EFFECT

IF MANY OF these products fail to live up to their advertised claims, why do people buy them? With prices ranging from about $30 to ▶

Rick Zehr, consultant, Sausalito, California

PHOTOGRAPH: ACEY HARPER

Buying Advice

So you want to add a little more zip to your PC with a software accelerator? Here are a few shopping tips.

- **Talk to other users;** check forums on America Online and CompuServe.
- **Read more than one review** of the product.
- **Don't buy on impulse:** Low-cost products aren't always good buys.
- Look for products with a **money-back guarantee.**
- Buy products with **uninstall features.**

parallel and serial ports on many computers. The DVC-300 is scheduled to ship in the second quarter of this year.

Intel's Klamath Gets a Name

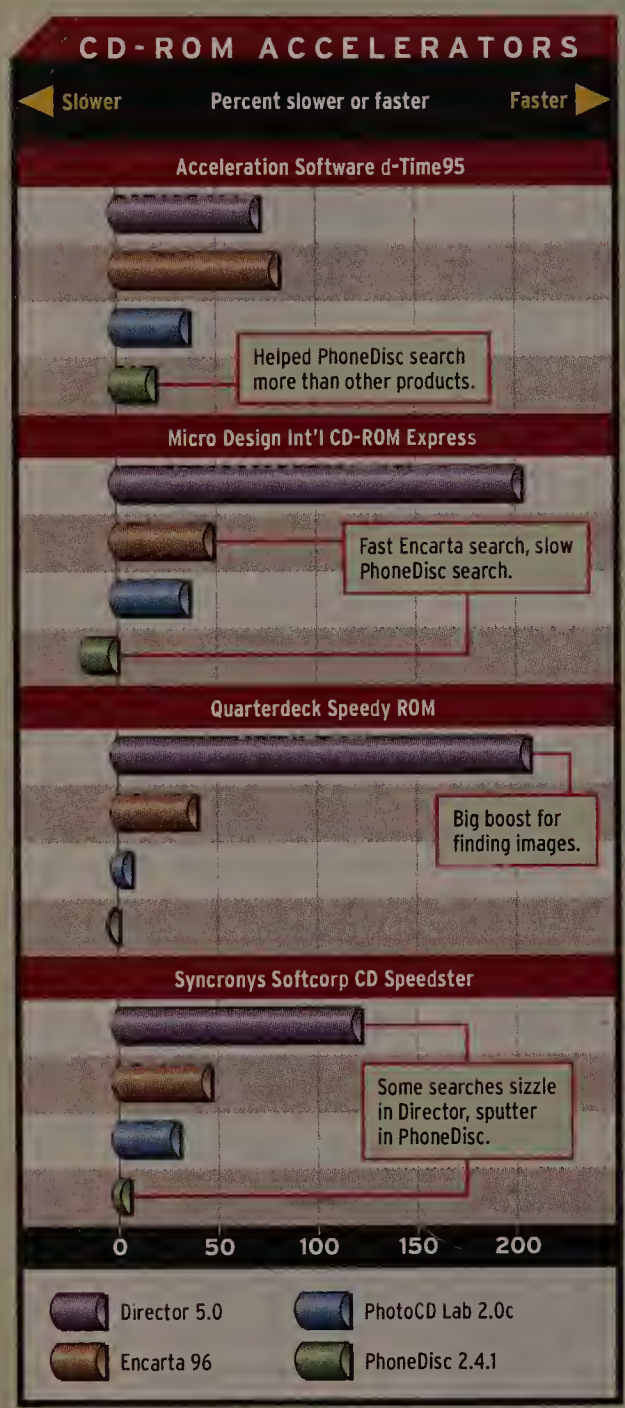
Intel officially named its latest CPU today: The chip formerly known by the code name Klamath is now titled the Pentium II processor. "This is very much a Pentium Pro type of processor with the added benefit of MMX technology," says Intel spokesperson Manny Vara. Intel will sell the product—expected to be faster and costlier than the company's other CPUs—to the business market. The Pentium II will be released in the first half of 1997, and should boast speeds of 233 MHz and higher.

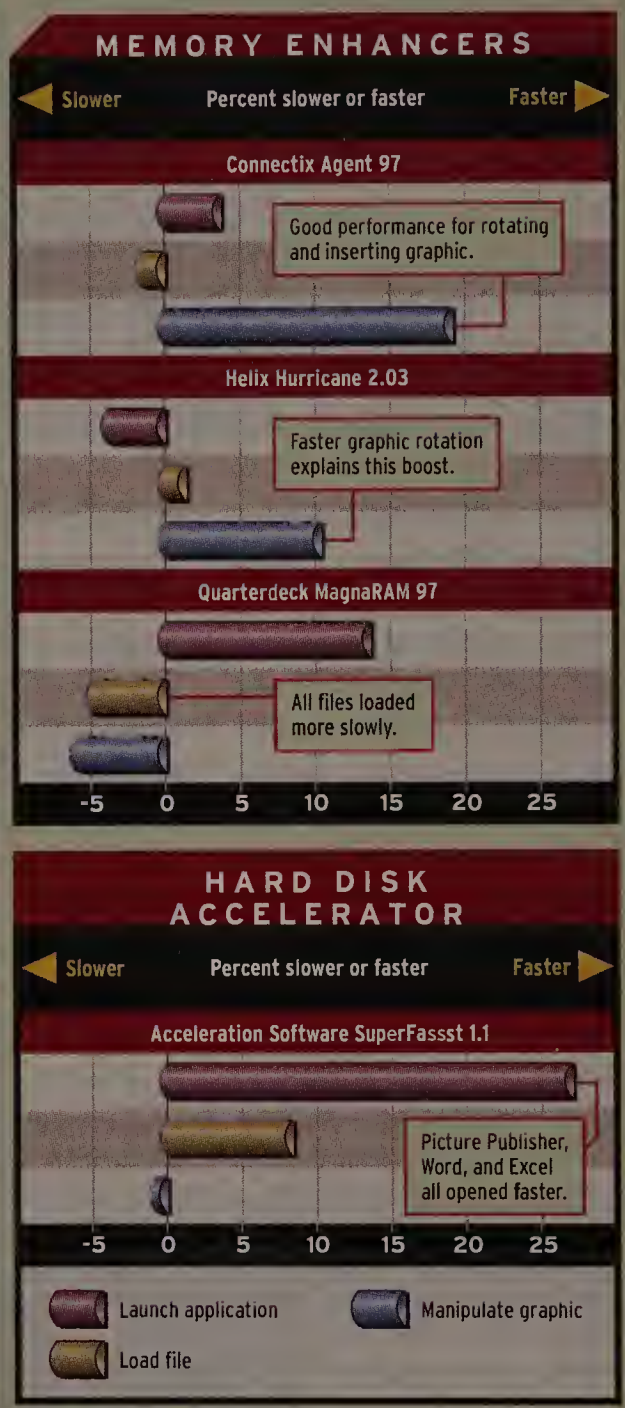
Faulty Drives on Some HP Systems

Some 1.6GB hard drives that shipped with Hewlett-Packard's Vectra VL 4 and Vectra 500 series PCs may fail, Hewlett-Packard confirms. "The models that had the problem were discontinued after November 1," says Ken Bosley, product manager for the Vectra VL series. "But if someone is experiencing the problem, we'd like them to call us." Faulty drives will generate error messages such as 'bad sector', 'inability to read', or 'ECC error'. HP will replace the units on site, or owners can ship them to the manufacturer. For more information, call Hewlett-Packard at 970/635-1000. ▶

Mixed Results for Software Acceleration

Only CD-ROM products look like clear winners in testing.





How We Test

CD-ROM accelerators: We ran four tests under Windows 95 at 1024 by 768 with 256 colors on a Gateway 2000 P5-166XL with 16MB of RAM and a Wearnes CDD-620 6X CD-ROM drive. We ran a Macromedia Director 5.0 I/O benchmark, Microsoft Encarta 96 script, PhoneDisc 2.4.1 timed-name search, and Corel photoCD Lab 2.0c 98-image slide show. We then added the CD-ROM cache, reran the tests, and compared the results.

RAM enhancers and hard disk accelerator: We ran nine tests under Windows 95 on a Micron Millennia P-90 with 16MB of RAM. The launch-application tests, load-file tests, and graphic-manipulation tests were each performed in Picture Publisher, Word, and Excel. All tests in Excel were run with Word open. We then added the hard disk accelerator or RAM enhancer, reran the tests, and compared the results.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

$60, utility packages are impulse buys, says Donald Driscoll, a San Francisco Bay Area attorney. Driscoll filed a 1996 class-action lawsuit against Syncronys, claiming that its SoftRAM 95 RAM enhancement product failed to improve performance; the company settled out of court. With prices so low, Driscoll says, "what they see are point-of-sale placebos."

But PC users are catching on. Take Bob Rekieta, a software support analyst at Cray Research in Eagan, Minnesota. Rekieta says he is returning his MagnaRAM 97 upgrade because the new Turbo Load feature slowed application load times. "MagnaRAM 97 didn't do what I hoped it would," he explains. Rekieta says the manual includes a warning that Turbo Load may slow some application load times, but that no such mention appears on the box.

Rick Zehr, a computer consultant and satisfied user of SuperFassst and MagnaRAM in Sausalito, California, adds: "[SuperFassst's] advertising claims are a little overblown. They also claim some benefits that I don't see, [such as] accelerating disk access."

At least one vendor has toned down its claims. Seeing little chance to boost system performance, Connectix positioned Agent 97 as a tool that helps prevent system crashes. The product packaging barely mentions RAM compression and performance.

NO EASY PANACEA

ULTIMATELY, there's a limit to how much software can improve performance. With RAM and PC prices so low, desktop users should first explore hardware solutions to performance problems. No memory enhancer *PC World* has tested offers better performance than that provided by adding more RAM. Still, those unable to upgrade hardware—such as notebook users who can't afford RAM modules—may find value in the products. And CD-ROM accelerators clearly can extend the life of poky drives.

The acceleration software market is filled with hype and hyperbole. But the bright packaging conceals a darker reality—these programs can often hurt performance as much as they help. Says Zehr: "There is a definite neurosis among computer users—the desire for speed comes up, and you just have to have another little tweak."

Sometimes, it's best to just say no.

—*Michael Desmond*

Sneak Peek: Windows 97

ANALYSIS

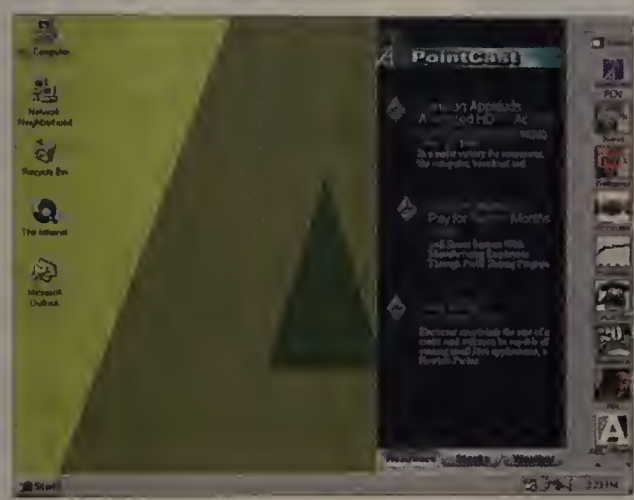
WINDOWS 95's successor is gradually taking on an identifiable form. Though beta testing of the operating system, code-named Memphis, was scheduled to begin at the end of March, we were able to review documentation for an alpha version and confirm the features with Microsoft.

As we reported in January, you will not have to buy Memphis to get many of its key features (see "War of the Windows: NT 4.0 Versus 95"). Windows 95 OEM Service Release 2, which began shipping with new PCs late in 1996, uses the more efficient FAT32 file system and supports digital cameras with Universal Serial Bus connectors.

THE IE INTERFACE

MEMPHIS's most important interface enhancements will still come in the form of Internet Explorer 4. IE will unite the standard Windows Explorer interface with the IE Web browser, allowing you to view Web pages and navigate your hard disk from the same screen. A feature called Active Desktop allows you to view data pushed over the Web by services such as the PointCast Network. The new browser may be available in beta by the time you read this, with a final version released as a free download by the end of June.

Other enhancements will be available only in Memphis. It will ship with the FAT16-to-FAT32 conversion utility that was omitted from OSR2. You'll be able to convert existing FAT16 volumes to FAT32 without backing up and repartitioning your hard drive and restoring your files. Support for multiple displays will let you install up to eight PCI video boards and view different documents simultaneously on different monitors. For example, you could view one spreadsheet on one screen and another on a second screen. Vendors could create games that displayed different graphics on multiple monitors, surrounding users with an image much as Surround Sound encloses them in sound. The new Advanced Configuration and Power Interface power management spec shuts down every drive, display, and PC Card—even the power supply's fan—to minimize power consumption and extend battery life. A system that supports ACPI sleeps so deeply that powering off the machine itself is not necessary. Microsoft claims the system will wake almost instantly in response to a mouse click or an incoming fax. Memphis will also support more types of USB devices, DVD drives, and the IEEE 1394 high-speed interface used by newer digital video cameras.



THE ACTIVE DESKTOP FEATURE of IE 4 integrates with Memphis and lets you view Web data sent to your desktop.

NOT THE NEXT BIG THING

MEANWHILE, additional Internet Explorer features have been identified. Beefed-up bookmarks called Smart Favorites will notify users when frequently visited Web sites have changed, and even download and cache previously visited pages in the background if their content changes.

Our take? Memphis will be a minor event compared to Windows 95's launch. If your future includes the latest, greatest hardware, you'll probably want to invest in Memphis. But unless Microsoft comes up with more innovations, most PC users may find an upgrade to IE 4 is enough—and a nice alternative to spending the $90 or so for the new OS.

—*Scott Spanbauer* ▶

THE NEXT WINDOWS

NEWEST FEATURES expected in the finished product:

- FAT16-to-FAT32 conversion utility
- Support for up to eight monitors connected to a single PC
- Advanced Configuration and Power Interface—improved power management that lets PCs sleep deeply, then wake up instantly
- Support for USB and IEEE 1394 devices and DVD drives
- Smart Favorites—intelligent bookmarks that are part of IE 4

JUST IN

State Considers E-Mail Decency Law

A proposed Maryland bill regulating what can and cannot be said in e-mail messages is refueling the debate over free speech in cyberspace. **Maryland House Bill 778 would make it illegal to send anonymous or repeated e-mail messages that are annoying or discomforting.** Critics say the bill violates the First Amendment. Proponents say the proposals simply modernize an existing telephone misuse law. (In Maryland it is a crime to make anonymous calls that annoy, abuse, torment, harass, or embarrass someone.) Analysts say that whatever the bill's outcome, e-mail regulation is not far off. Over a dozen states have already passed or are considering Internet-related decency laws.

TidBytes

VOICE, DATA, AND CONFERENCE SIMULTANEOUSLY: Data Race's BeThere Personal Multiplexer system is a client-server product that handles e-mail, voice calls, and even conference calls over a single phone line—simultaneously. The client part of the product sells for under $600; overall pricing is based on a per-port and per-use system. **400-MHz P6 With MMX:** Intel demonstrated a CPU prototype that could appear in high-end PCs by the end of next year. Intel says one operation on a 3-D model that used to take 26 seconds on a Pentium Pro-200 PC takes only 14 seconds with the advanced CPU.

Internet Access: How Long Can Flat Rates Last?

CONSUMER ALERT

GET READY TO PAY more for your Internet connections—or to get less for your money. The chronic busy signals America Online users encountered in January led to a multimillion-dollar settlement out of court.

Despite the settlement, however, problems continue to vex online business users. Janet L. Spiegel of Spiegel Media Entertainment Communications says she was frustrated by the constant busy signals and wondered if she was receiving all her important e-mail. In addition, she said she could not change service providers because she'd given her e-mail address to so many people.

"I'm going back to communicating by faxes and snail mail."

–Janet L. Spiegel, Spiegel Media Entertainment Communications, West Hollywood, California

UNIVERSAL HASSLE

AOL'S DIFFICULTY is merely an extreme example of a growing trend: Providers can't keep up with demand, and service outages are all too common. Millions of users expect to be able to log on at any time for as long as they want and pay just $20 a month. That expectation may soon be deflated by a market and technology developments that place cheap Internet access at risk. Many Internet service providers and online services say they can make a profit from the $20-per-month charge only when users connect for fewer than 8 hours each month. Larger ISPs can sustain longer connect times profitably because they control more of their data network costs. But under current conditions, no ISP can survive the heavy usage that has become typical of flat-rate payers—up to an hour a day or more per user.

Some of the largest ISPs admit they are stuck at the $20-per-month price for competitive reasons. No one wants to be the first to break away. Among the biggest online services, only CompuServe has resisted the flat-rate siren song (see "Alternatives to the Flat Rate"). But $20 per month leaves little money for investing in more and better connections, or for maintaining tech support. Some ISPs such as Netcom plan to direct more attention to the premium business market, although they have not yet given up on the $20-per-month fee for existing subscribers.

For competitive reasons, Netcom and other providers will not disclose specific plans. But Alan Taetle, vice president of sales and product management for Atlanta-based MindSpring, one of the largest ISPs, predicts, "You may see a change in the term *unlimited*." He expects that many ISPs will shortly add a surcharge affecting the heaviest users. Initially the surcharge might kick in after 200 hours a month, a burden only for extreme Internet junkies.

If users were shifted away from peak-time usage in the early evening, the current traffic jams could be prevented—phone lines already in place have enough capacity to handle the load. ISPs could accomplish this shift by charging users according to the time of day they connected.

Higher rates for peak-period access seem likely to proliferate before the end of 1997. The University of Michigan, which operates a noncommercial Internet service provider, now charges 44 cents an hour for prime time (from 5 to 11 p.m.) but only 11 cents an hour in the early morning.

STOPGAP SOLUTIONS

SOME FLAT-RATE providers have already attempted to raise revenues with premium services. MindSpring now charges $19.95 for regular Net access; for $7 more, you can get the Clarinet news service, two additional e-mail addresses, and your own home page. MindSpring's Taetle believes this cable TV–like model, which bundles extra-cost services, will replace flat-rate pricing for many users.

The immediate problem of too many busy signals is a call for online services such as AOL to install more modems and phone lines. ISPs and online services typically can accommodate about 5 percent of their customers at any one time; AOL has been able to handle only 3 percent, but it plans to increase its capacity to 5 percent by summer. And more providers will inevitably need to set prices that discourage users from connecting for long periods and charge higher rates for unrestricted service. Seattle-based Northwest Nexus, for example, charges $30 per month for unrestricted service; but for $22.50 you can get service that permits you to be online for 2 hours at a stretch but then requires you to log off for 2 hours.

Ultimately, the Baby Bells and long-distance compa- ▶

PHOTOGRAPH: GARY MOSS

Now there's an easier way to control your PC from far away.

It seems like most remote control software must have been designed by mad scientists. Complicated connections. Convoluted file transfers. Confounding controls. And security that leaves you feeling anything but secure.

But all that's history. Because now there's Quarterdeck® Rapid Remote™– from the makers of Procomm,® the world's best-selling PC communications software.

Finally, remote control for the rest of us.

Rapid Remote makes it easy to control your PC from anywhere! ***SmartWizards*** walk you through every step of connecting to another PC; just double-click and your connection is made, whether it's via modem, TCP/IP or Novell SPX network, Internet or direct serial connection.

It's all you need to access any file or application from home or on the road, easily. Just drag-and-drop to transfer files. Print to host or guest printers without fuss. Even if you've never used remote software before, you'll be running like a pro right away.

Remote control without the wait.

And you'll be running *fast*. In fact, you can't buy faster remote control.† Features like ***Fast Screen Refresh*** and ***Turbo Transfer*** (which only sends the parts of a file that have changed) minimize connection costs and save you time and money. And with the 32-bit power of Windows 95, Rapid Remote even lets you transfer files and control another PC at the same time. So instead of waiting, you can be working.

Protection from prying eyes.

Rapid Remote provides total security for your data, too. Control guest access by granting specific rights to each guest account. Or keep your sessions secure – even over the Internet – with powerful data encryption. Now you can control your PC from across town or across the globe, and be confident you're protected.

And with our 30-day Money-Back Guarantee, Rapid Remote is even safe to own! To put fast, easy remote control to work for you, visit your local retailer, call the number below, or visit us at **www.quarterdeck.com.**

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Call now and we'll rush you Rapid Remote FREE! Pay only a $5.00 shipping and handling fee. If Rapid Remote isn't as easy as remote computing can be, return it within 30 days and owe nothing more. If you like it, pay only $69.95. If you already own another remote control product, ask about our special competitive upgrade offer.

OFFER GOOD THROUGH 4/30/97 CODE 01800

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Circle 185 on reader service card

nies that own the telecommunications infrastructure must increase capacity. Internet traffic reduces the calling capacity of the phone system, which is able to support only about 10 percent of all telephones at any given time.

WHO SHOULD PAY?

CLEARLY, computer users accustomed to low, flat-rate Internet access don't want to foot the bill. But phone companies say the regulated telephone tariffs were set up for voice calls rather than data. The average voice call lasts about 4 minutes, and in California the average phone customer talks only 17 minutes a day, according to Pacific Bell. But the average Internet user logs on for 45 minutes a day.

Telephone companies want the ISPs to reimburse them for the increase in the phone system's load—just as the long-distance companies reimburse local telephone companies for the long-distance calls that go through the local phone system. In 1983, the Federal Communications Commission exempted data services from such reimbursements to encourage what was then a new industry. The phone companies say this exemption is now an obsolete subsidy, paid by their shareholders and phone customers for the benefit of Net users.

Critics reject such arguments as disingenuous. Fred Goldstein, a telecommunications consultant at BBN, a company instrumental in the development of the Internet, points out that in the early 1990s, phone companies bet on slow annual growth—laying off thousands of workers and trimming phone-switching capacity. And several Baby Bells convinced state regulators to change from their traditional phone pricing, which was based on costs plus a fixed percentage profit, to a new capped-rate price that let the phone company keep the savings from improved efficiency. These changes constricted phone company capacity just as the Internet boom began.

> Until providers improve their networks, most of us will face connection logjams and higher Internet access fees.

Meanwhile ISPs pay a flat rate for the phone lines used to provide Internet access. This makes possible the $20-per-month Internet connection offered by independent ISPs—and also by the online service divisions of the same phone companies that complain about Internet pricing.

There's always the chance that generating revenue by selling advertisements will ease the pressure to raise Internet connection rates. Bigger.net, a new California-based ISP, offers unlimited lifetime Internet service for a one-time $60 setup charge plus $10 a year for e-mail. (These rates are initially available only in the San Francisco Bay Area.) Bigger.net will need to recoup $320 a year per subscriber in advertising revenue to pay for the service, which keeps an advertisement on screen at all times. "It's going to be very difficult for them to generate enough...advertising to cover the cost of keeping their networks up and running," says J. William Gurley, an analyst for the Deutsche Morgan Grenfell Technology Group.

In the long run, low access rates depend on the Internet moving from voice lines to true data lines that support packet-switching technology. Voice lines and ISDN lines in use today are inefficient and costly for carrying data.

NETWORK SOLUTION

PACKET-SWITCHED data networks are far more efficient. Cable modems, and Digital Subscriber Lines technology (DSL or xDSL) that runs over phone lines both use packet switching and could ultimately reduce the cost of data connections. They operate independently of the voice phone system and allow continuous 24-hour connection without tying up telephone circuits.

But a packet-switched data network that's both accessible and affordable to most consumers and businesses will require a major initial investment—essentially the creation of a second telecommunications network running in parallel to the voice phone system. That prospect is a number of years away, and it may never be universally available. But until providers create a packet network, most of us will face connection logjams and higher Internet access fees.

—*Cary Lu* ▶

Alternatives to the Flat Rate

MOST LARGE service providers charge about $20 a month for unlimited Internet access. But an increasing number of smaller providers, plus a few large ones, recognize the inevitable: Providing service costs too much to allow unlimited access at such a low rate. The companies shown here—representative of many nationwide—have bucked the flat-rate model, either by charging higher prices for basic service or by pushing heavy users into premium categories.

INTERNET SERVICE PROVIDER	Monthly base rate [1]	Base service	Premium service
CompuServe 800/848-8990	$24.95	20 hours, $1.95 each additional hour	not available
DNAI [2] 510/649-6110	$25	100 hours, 50 cents each additional hour	not available
The Microsoft Network 800/386-5550	$6.95	5 hours, $2.50 each additional hour	not available
MindSpring 800/719-4332	$19.95	unlimited access	$26.95 monthly includes 10MB of Web/FTP space, two extra e-mail boxes
Northwest Nexus 206/455-3505	$22.50	restricted access; 2-hour maximum session must be followed by 2 hours offline; read and compose e-mail offline	$30 monthly permits 24-hour sessions, includes subscription to financial market tracking

[1] Setup charges may apply. [2] Local provider.

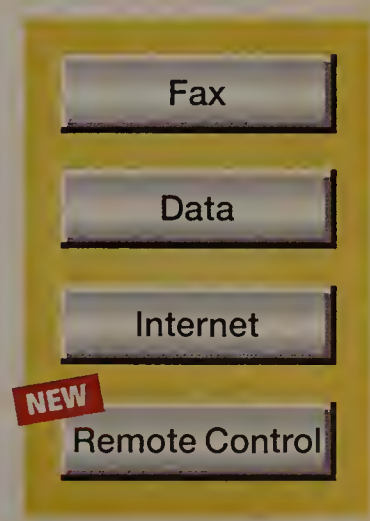
Great. Just when we'd perfected communications software for *this* planet.

We thought we had it all figured out. After all, our new Procomm Plus® for Windows 95 can connect you to virtually anyone, anywhere on this planet.

Especially now that we've integrated secure, fast remote control capabilities into the world's best-selling PC communications software. So you have quick, easy access to your files and applications wherever you are.

Our advanced fax features include OCR, annotation and scanner support for graphics and signatures. While our 36 terminal emulations help you link up to a wide variety of corporate host systems. We've also made life simple with access to the Internet via mail, a newsreader and state-of-the-art web browsing through the included Microsoft® Internet Explorer.

And we integrated it all with a Connection Directory that lets you fax, browse and transfer files without having to jump from one application to another or reconfigure your system settings every single time.



Basically, what we've created is the most advanced 32-bit multitasking communications package on earth. And for now, we'll just have to settle for that. To find out more call 1-800-282-0866, code 01718, visit your nearest store or come to www.quarterdeck.com.

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Circle 190 on reader service card

MMX Upgrades Whip Old PCs Into Shape

PC BUYERS stung by obsolescence just got some relief. Earlier this month, Intel released its Pentium OverDrive processors with MMX technology, a series of retail upgrade packages for 75-, 90-, and 100-MHz Pentium systems. Like earlier OverDrive chips, Intel's latest upgrades let you put a faster CPU in your aging PC. Perhaps more important, the chips allow older PCs to run applications that have been optimized for the new generation of Pentium MMX processors.

REWRITING HISTORY

EARLIER PENTIUM OverDrive chips for P-75s, P-90s, and P-100s showed relatively modest performance gains on PC WorldBench tests, ranging from 8 to 15 percent (see "Turbocharge Your Pentium PC," April 1996; and "Upgrades: The Best for the Buck," *Top of the News*, November 1996). This time, our tests reveal the most compelling OverDrive yet—with gains averaging more than 27 percent.

We evaluated the OverDrive MMX chips using the PC WorldBench test suite on 75-MHz and 90-MHz PCs from Hewlett-Packard, both outfitted with 16MB of RAM. The OverDrive MMX upgrade chips boost internal CPU clock speed by 67 percent, so a 75-MHz system runs at 125 MHz, a 90-MHz system at 150 MHz, and a 100-MHz system at 166 MHz. These clock boosts are identical to those provided by previous OverDrive products, but the new upgrades incorporate design elements found in Pentium MMX CPUs. The result: more efficient processors.

The Pentium-75, upgraded with a 125-MHz OverDrive MMX, posted the largest gain, improving nearly 31 percent after the upgrade, while the performance score of the P-90, upgraded with a 150-MHz OverDrive MMX, improved by 24 percent. We noted even more impressive gains—averaging 87 percent—with MMX-enhanced applications, such as Adobe Photoshop.

The upgraded P-90 nearly matched the average performance of P-150 systems, with a PC WorldBench score of 181. The upgraded P-75's PC WorldBench score of 148 lagged behind the average score for P-120 PCs by about 13 percent. Apparently, the advantage in CPU clock speed and architecture are offset by a slower motherboard (50 MHz versus 60 MHz) and the performance of your older system components, such as memory and hard disk.

And be warned, this upgrade is not cheap. The 125- and 150-MHz OverDrive MMX chips retail for $399, while the 166-MHz flavor will set you back as much as $499. Still, the incremental cost may allow you to wring one or two more years of useful life out of your existing PC. If you're waiting for the forthcoming P6 processors, you may find an OverDrive upgrade just the ticket.

The upgrade product converts the standard 3.3-volt power on Pentium motherboards to the internal 2.8-volt level used by the Pentium MMX CPU, and it includes an integrated heat sink and fan to prevent overheating.

TRYING THIS AT HOME

REPLACING A CPU is not a small task—break a pin, and you've lost $500—but ▶

Intel's OverDrive MMX offers **the best way** yet to **extend the life** of your aging PC a year or two.

PHOTOGRAPH: JOHN GREENLEIGH

Intel Pentium OverDrive With MMX Technology

PRO: Best OverDrive upgrade yet, MMX to boot.

CON: High price.

VALUE: Strong CPU will extend the life of your old system.

List price: 125- and 150-MHz chips $399, 166-MHz chip $499

Intel

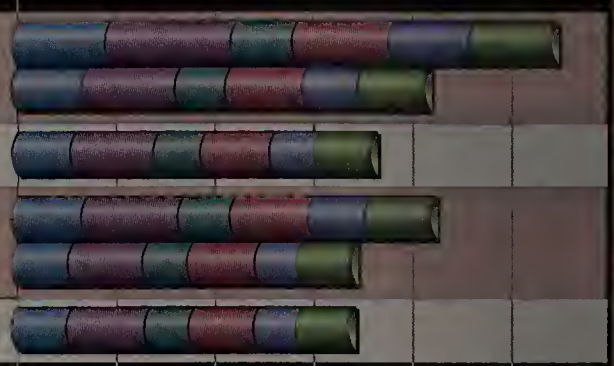
800/538-3373

http://www.intel.com/procs/overdrive

READER SERVICE NO. 800

BUSINESS APP BOOSTER

SYSTEMS	Improvement with upgrade (percent)	PC WorldBench score
Pentium-75	–	113
with OverDrive MMX-125	31	148
Average Pentium-120	–	171
Pentium-90	–	146
with OverDrive MMX-150	24	181
Average Pentium-150	–	183



Word 7.0 for Windows 95 · Picture Publisher 6.0 for Windows 95 · WordPerfect 6.1 for Windows · Excel 7.0 for Windows 95 · Paradox 5.0 for Windows · 1-2-3 release 5 for Windows

HOW WE TEST We loaded the PC WorldBench test suite on Pentium-75 and Pentium-90 systems, each configured with a 256K secondary cache and 16MB of RAM. To gauge OverDrive MMX performance, we installed the appropriate OverDrive and reran the WorldBench suite. The P-75 system was an HP Multimedia 6140S, the P-90 an HP Multimedia 6170S. Testing conducted by the PC World Test Center. All rights reserved.

BREAKTHROUGH!

Fix-It™ is the easiest way to find and fix Windows problems. Guaranteed!

Quarterdeck Fix-It is the breakthrough you need to solve system problems, conflicts and errors in Windows 95. And unlike Cybermedia's First Aid, Fix-It has a knowledge base of over 1,000 applications and superior emergency recovery. Get the power to help end the frustration of Windows 95 problems today!

Windows 95 - what a mess!

Every new program and peripheral adds new potential problems to your Windows 95 system. Software conflicts and hardware configuration errors can crash your PC in seconds. Botched installations or sloppy uninstalls can cause havoc and slow your system down. Most diagnostic utilities won't even catch many of these problems. They only analyze your hardware devices, or a limited number of applications.

But Fix-It can prevent software conflicts and configuration errors in hundreds of applications and hardware devices before they stop you!

Fix-It solves the problem

Fix-It starts with an automatic, comprehensive scan of your entire system – applications, the Windows 95 registry, configuration files, devices and drivers. It analyzes everything you're using against its extensive application knowledge base of over 1,000 Windows 95, 3.x and DOS applications. Then it fixes problems before they put you in a fix.

The *Preinstallation Inspector* finds potential conflicts in new applications before you install them. And, *Crash Defender* automatically intercepts crashes to give you the best chance to save your data.

See what a breakthrough Fix-It is today. To learn more, call the toll-free number below, visit your local retailer, or visit **www.quarterdeck.com** and download a **FREE TRIAL**.

TRY FIX-IT™ RISK-FREE
ONLY $29.95
CALL 1-800-683-6696

Call now and we'll rush you Fix-It for $29.95 plus shipping and handling. If you're not 100% satisfied, return it within 30 days for a full refund. Not valid with any other offer. Hurry, this is a limited time offer.

Call 1-800-225-8148 for volume licensing prices.

Offer Expires 4/30/97 Offer Code 01306

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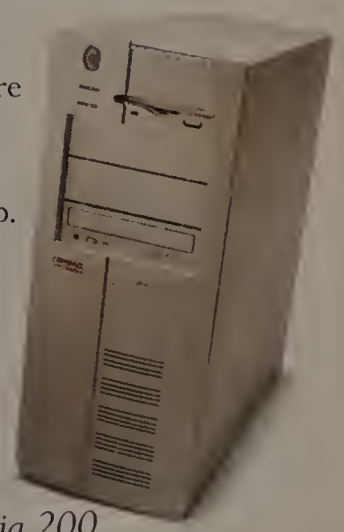
COMPAQ

There Comes A Point When Every Company Has To Look Itself In The Mirror And Say One Word: Server.

PCs linked together no longer provide the resources you need to run your business. Which is why we're introducing the Compaq ProSignia 200. It creates a robust computing environment that enables you to share information and resources over a network. Even as you connect more and more people together—e-mail, access to files and printing take mere seconds, making your employees more productive. And your business more competitive.

How much would you spend to have this? How about the price of a desktop? The ProSignia 200 is the first true server designed for your growing business. It has superior price:performance, industry-leading manageability and proven integration.

Managing the ProSignia 200 doesn't demand a lot of time or people. With SmartStart and Insight Manager, configuration and management are easy and always under control. And Compaq offers the most extensive Pre-Failure Warranty, one which reduces downtime by replacing key components when performance levels dip. For more information on the ProSignia 200, call your local Compaq Authorized Reseller or visit us at www.compaq.com. The ProSignia 200. The server for successful companies in their formative years.



The ProSignia 200

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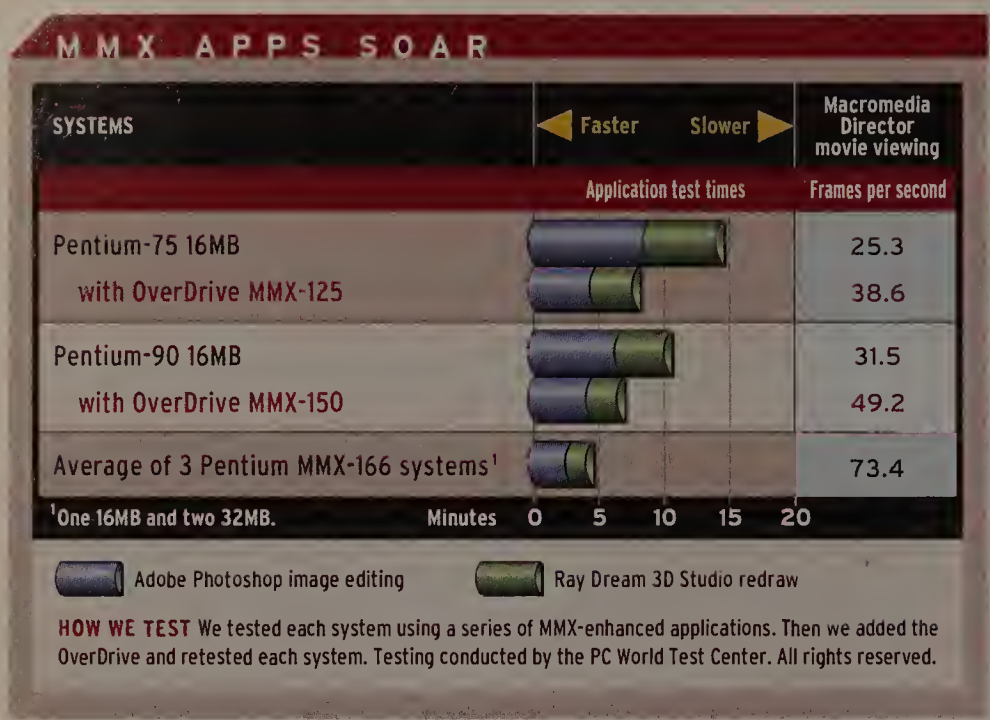


HOW WE TEST We tested each system using a series of MMX-enhanced applications. Then we added the OverDrive and retested each system. Testing conducted by the PC World Test Center. All rights reserved.

Intel's user-friendly documentation should ease the process for users. In addition, the company addresses compatibility concerns with a continually updated list of compatible systems. You can find the list on the Web at http://www.intel.com/overdrive/. The list includes thousands of systems.

OverDrive MMX CPUs support 57 new instructions that handle multimedia operations such as graphics, video, and audio. Without an MMX CPU, many MMX-enhanced titles and applications run poorly or not at all.

To test MMX performance, we ran a series of custom tests using MMX-enhanced versions of Adobe Photoshop, Macromedia Director, and RayDream 3D Studio. All three apps showed substantial performance increases. The P-75 upgraded with the 125-MHz OverDrive MMX ran our Photoshop test 87 percent faster with the OverDrive upgrade. The Gaussian blur portion of the test—an image-filter operation—improved by almost 240 percent. Manipulation and redraws of 3-D scenes in RayDream 3D Studio improved by almost 70 percent, while animation and graphics in Macromedia Director speeded up by approximately 53 percent.

CLOSING THOUGHTS

IS THIS ENOUGH of a boost to satisfy the most demanding MMX titles? That depends. Image editing professionals might not be satisfied with the performance of an upgraded P-75 system, which trailed the average speed displayed by three Pentium MMX-166 PCs tested for our February issue by 40 to 50 percent. The Pentium-90 did little better; its performance trailed the Pentium MMX-166 average by 32 to 36 percent. If you are considering an OverDrive MMX upgrade for serious graphics work, or even to play games such as Ferris Wolf's Rebel Moon Rising or Ubi Soft Entertainment's Pod, you may be disappointed.

Ultimately, no single PC upgrade offers the performance of a new system. But Intel's OverDrive MMX delivers good performance gains and lets you run MMX-enhanced software. It's the best way yet to extend the life of an aging PC.

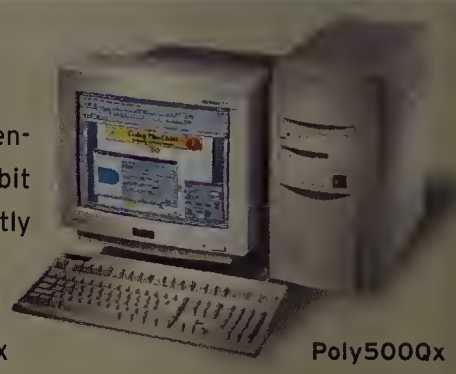
—Michael Desmond ■

AMD's K5-PR166 CPU Matches Top Pentiums

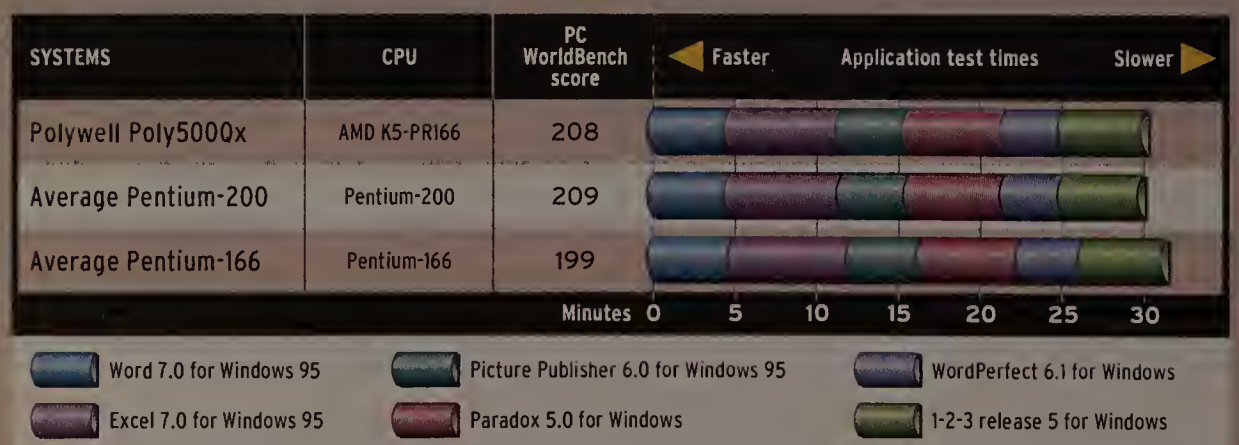
CPU MAKER AMD has been struggling. Chronic delays with its Pentium-class K5 CPU cost the company key partnerships with PC vendors such as Compaq. Now AMD's hard times may be over, with the introduction of the K5-PR166 processor, a 116.7-MHz CPU that looks like a winner.

We tested Polywell's Poly500Qx system outfitted with a K5-PR166 CPU, 16MB of SDRAM, and a 512K secondary cache. The system outperformed systems using the Intel Pentium-166 and Cyrix 6x86-P166+, coming up just shy of the average for similarly configured Pentium-200 PCs. The K5-PR166 enjoyed a slight edge over Pentium-200 competition in 32-bit applications while trailing slightly in all 16-bit apps.

The results are good news for PC buyers. The Poly500Qx sells for just $1650 with a 2.1GB hard disk, a 12X CD-ROM drive, and a 15-inch monitor—approximately $300 to $400 less than Pentium-200 systems offering similar performance. Acer plans to use the K5-PR166 in its low-priced computers.



Poly500Qx



HOW WE TEST We tested all systems under PC WorldBench. Higher PC WorldBench scores are better. Data based on PC WorldBench testing conducted by the PC World Test Center. All rights reserved.

The chip is giving AMD momentum for the release of its K6 CPU, which will compete with Intel's new Klamath, says Linley Gwennap, editor of the *Microprocessor Report* newsletter. K6 systems should be more affordable than their Intel counterparts.

Polywell, 800/999-1278, http://www.polywell.com

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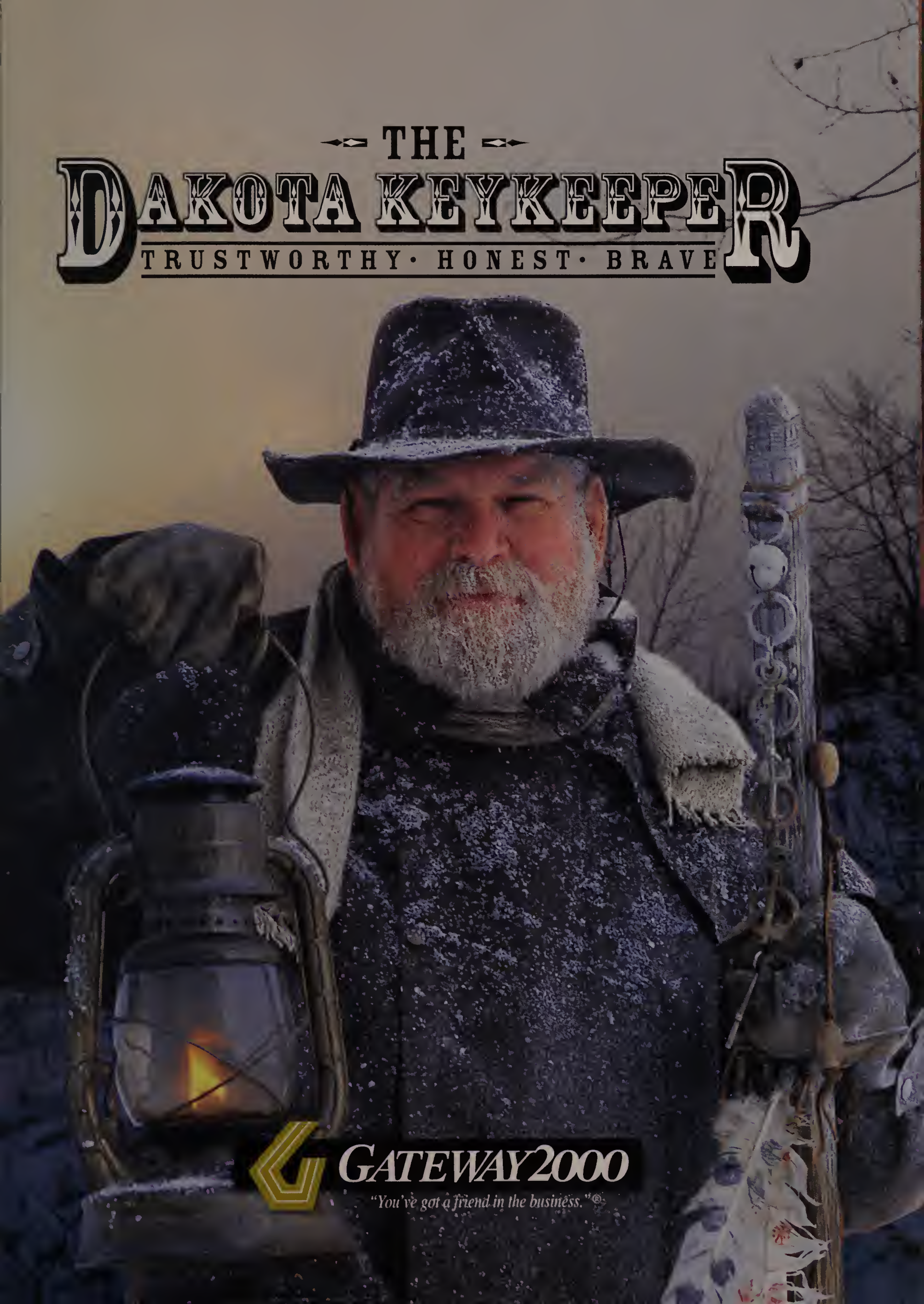
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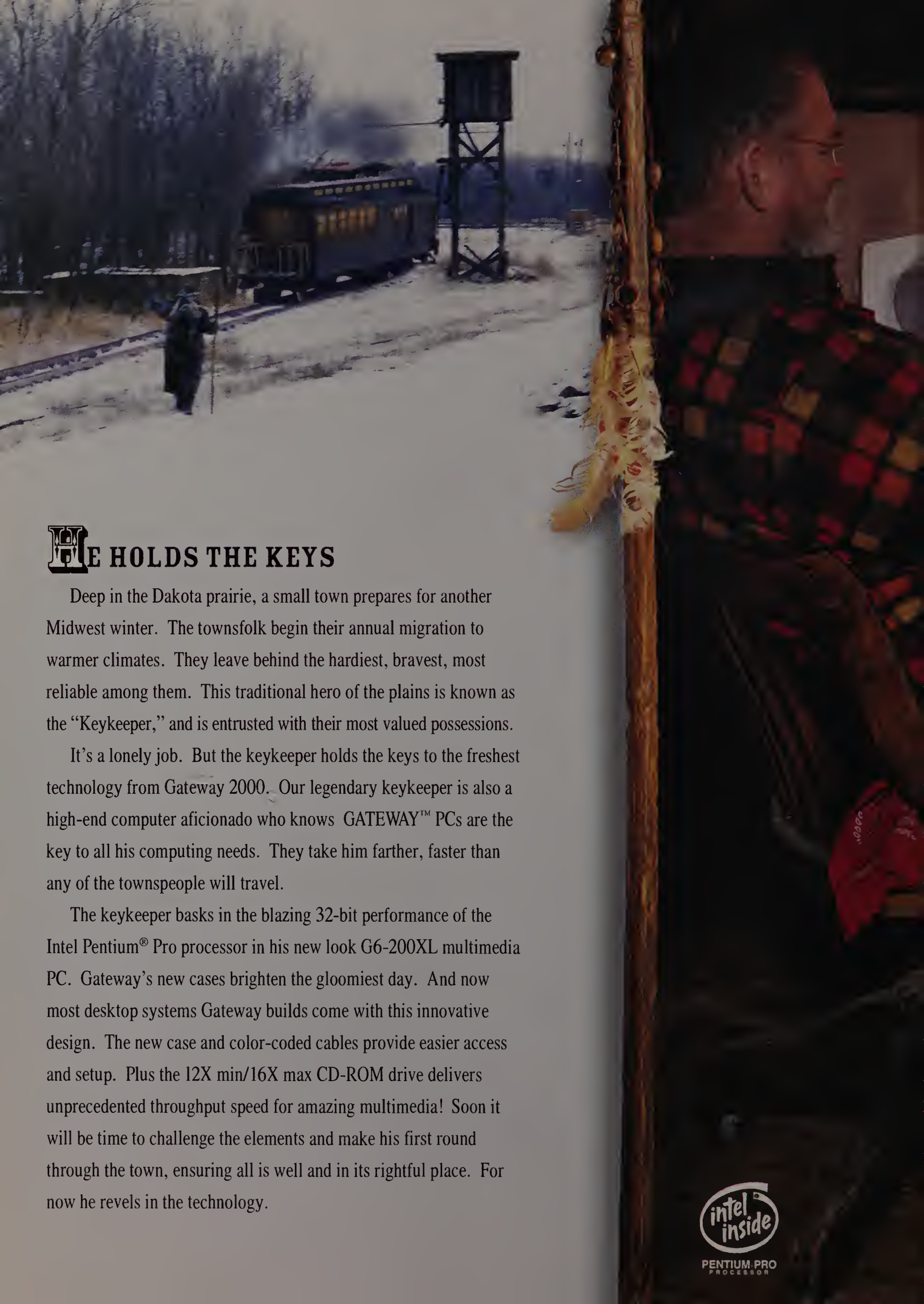

HE HOLDS THE KEYS

Deep in the Dakota prairie, a small town prepares for another Midwest winter. The townsfolk begin their annual migration to warmer climates. They leave behind the hardiest, bravest, most reliable among them. This traditional hero of the plains is known as the "Keykeeper," and is entrusted with their most valued possessions.

It's a lonely job. But the keykeeper holds the keys to the freshest technology from Gateway 2000. Our legendary keykeeper is also a high-end computer aficionado who knows GATEWAY™ PCs are the key to all his computing needs. They take him farther, faster than any of the townspeople will travel.

The keykeeper basks in the blazing 32-bit performance of the Intel Pentium® Pro processor in his new look G6-200XL multimedia PC. Gateway's new cases brighten the gloomiest day. And now most desktop systems Gateway builds come with this innovative design. The new case and color-coded cables provide easier access and setup. Plus the 12X min/16X max CD-ROM drive delivers unprecedented throughput speed for amazing multimedia! Soon it will be time to challenge the elements and make his first round through the town, ensuring all is well and in its rightful place. For now he revels in the technology.

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UNLOCK THE POWER

He forges a path through the raging blizzard. Waiting in the post office is a Gateway Solo™ 2200 portable PC, a force more powerful than the winter storm outside. Next to it is a high-performance G6-200 Pentium® Pro processor-based professional PC. Both systems can be custom configured and are loaded with great features. Microsoft® Office 97 Small Business Edition plus Encarta® 97 software is tailored to the needs of home and office. Keeping the post office organized is not only going to be easy, it's going to be fun. MS® Office 97 Small Business Edition plus Encarta 97 includes MS Word 97, Excel 97, Publisher 97, Automap® Streets and Outlook™ 97. The keykeeper could play post office all day, but duty calls.

intel inside
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OPEN NEW DOORS

He saved the schoolhouse for last. Here select systems from Gateway's entire product line tout the new Intel Pentium® processor with MMX™ technology — from Family PC™ systems to professional computers to Gateway Solo™ portables. Of course the Destination™ Big Screen PC line also includes MMX technology as an option. This group-computing PC and TV combination delivers the latest and greatest, and now some configurations include the EasyPhoto Drive™ scanner, too.

The keykeeper dives into the exceptional performance of Intel's next-generation Pentium processor with MMX technology. The extra L1 cache on the Pentium processor with MMX pays off instantly with an increase in raw horsepower. No wonder the February '97 *PC World* declared the custom-configured Gateway PC with a 200MHz Pentium processor with MMX, 4MB video card, 3.8GB hard drive, and Altec™ Lansing ACS 410 speaker system **"the fastest machine we have ever tested."** And *PC Magazine* gave it the **Editors' Choice Award** in the February 4 issue.

With the introduction of a 166MHz Pentium processor with MMX in the Gateway Solo 2200 portable line, he gets performance that compares to similarly configured Pentium processor-based desktops. The Dakotas have never been a place for the faint of heart, and now the Pentium processor with MMX technology makes it even more of an adventure.

Gateway holds the keys to *your* computer needs. Call us today.

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- 16-Bit Wavetable Sound & Stereo Speakers
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- 12.1" Active Matrix SVGA Color Display
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- 2MB EDO Video RAM
- Zoomed Video Port
- NTSC/PAL Video Output
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- Modular 3.5" Diskette Drive
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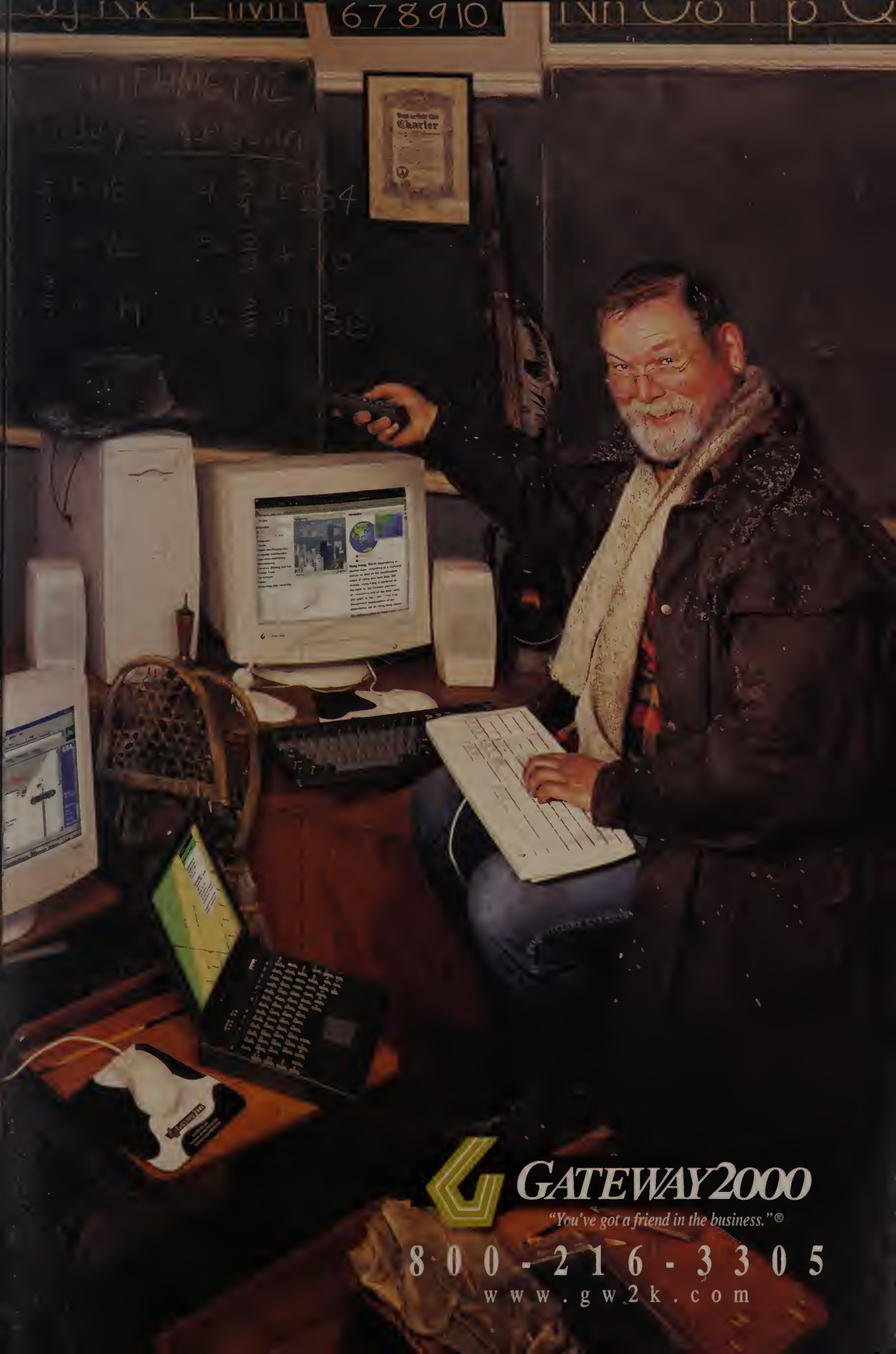
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- Altec ACS-410 & ACS-251 Speakers
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- Altec ACS-410 & ACS-251 Speakers
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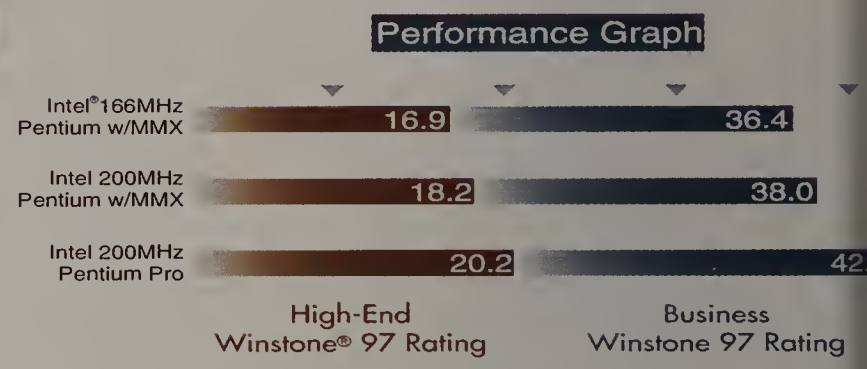

Ziff-Davis' Winstone 97 Version 1.0 produced scores of 16.9 and 36.4; 18.2 and 38.0; and 20.2 and 42.7 Winstone Version 1.0 units on its High-End Winstone 97 suite and Business Winstone 97 suite on Gateway 2000, Inc. PCs configured with 166MHz Intel Pentium Processor with MMX technology, 200MHz Intel Pentium Processor with MMX technology, and 200MHz Intel Pentium Pro processor, respectively. All Gateway 2000 PCs tested featured 32MB RAM, 256K RAM cache, 3.8GB hard disk, 1DE controller, FAT file system, and no hardware disk cache. Systems include S3 ViRGE/VX graphics adapter; with 4MB VRAM with v1,23m3 driver; 1024x768 with 256 colors; and a refresh rate of 75Hz. Test systems used MS DOS 7.1 and MS Windows 95. All products used in the test were shipping versions available to the general public, and the test and its results were not verified by Ziff Davis.

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- Intel 133MHz Pentium Processor
- 16MB Synchronous DRAM
- 256K Pipelined Burst Cache
- CrystalScan500 .28dp Monitor (13.9" viewable area)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 1.2GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- Mini Tower Case
- 104+ Keyboard & MS IntelliMouse
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P5-166

- Intel 166MHz Pentium Processor
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- 256K Pipelined Burst Cache
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- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 2.5GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- Mini Tower Case
- 104+ Keyboard & MS IntelliMouse
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P5-200

- Intel 200MHz Pentium Processor with MMX Technology
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- 2MB SGRAM, 3-D 64-Bit PCI Graphics
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- Hewlett-Packard DeskJet 820Cse Color Printer **$399**
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- **Iomega® Ditto™ 3200 Internal Tape Backup Unit $199**
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- **Iomega Internal Zip™ 100MB Drive $139**
  (includes three 100MB cartridges)
- **Iomega External Zip 100MB Drive $199**
  (before $50 manufacturer's rebate)
- **Iomega Jaz® 1GB Drive $429**
  (includes SCSI controller and 1GB cartridge)
- **MS Windows NT® 4.0 Upgrade $99**
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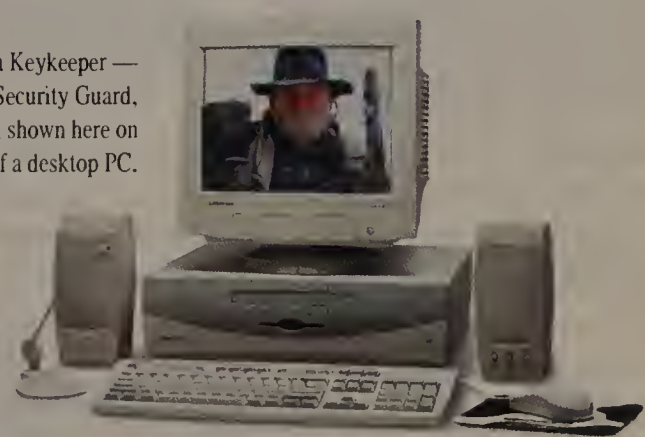
The Dakota Keykeeper — Gateway 2000 Security Guard, Ed Redenius, shown here on the screen of a desktop PC.



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NEW PRODUCTS

IBM, Polywell, Sony Join the MMX Fray

TANTALIZING TRIO: Pentium MMX-200 systems from Polywell, IBM, and Sony cater to a variety of users at surprisingly reasonable prices.

DESKTOP

DESPITE THE MIND-numbing hype of Intel's MMX chip rollout, there's no doubt that PCs built around the technology are hot property. This month's newcomers are from IBM, Sony, and the less-familiar Polywell.

As with most of the current crop of MMX systems, the top-of-the-line PCs we tested had numerous similarities among them. Each one was equipped with the Pentium MMX-200 processor; 32MB of RAM; large IDE hard disks (2.5GB in the IBM, 2.1GB in the Polywell, 3.8GB in the Sony); CD-ROM drives (16X on the Sony, 8X on the IBM and Polywell); Universal Serial Bus ports, for use with forthcoming USB peripherals and drivers; Windows 95; and a good selection of software. There are, however, some differences in the details, and the three machines appear to target different types of users.

MMX PCS FOR HOME AND OFFICE

THE IBM **PC 350 MMX** is all business, lacking the multimedia bells and whistles that are standard in the others. There's no sound card or speakers, even though native MMX software is expected to use the chip for sound processing. And a 17-inch monitor adds $819 to the price.

Though the model we tested had a Matrox Millennium video card with 4MB of WRAM, the entry-level system comes with a basic card that has just 1MB of RAM—not suited for fancy graphics or games.

In contrast, Sony's **VAIO PCV-120** is very much a home machine, although it would be comfortable in a full-time home office. It's loaded for bear, with a 33.6-kbps DSVD fax-modem, Surround Sound (with speakers in the monitor), MPEG video support, video jacks, and more software than you can twitch a mouse at. The biggest drawback is its 15-inch monitor; a model with a 17-inch monitor is expected to ship later this year.

The Polywell **Poly5200MX8** is

IBM PC 350 MMX

PRO: All business.

CON: No sound card, monitor extra.

VALUE: Reasonable, but no frills.

IBM Corp.

800/426-4968

http://www.pc.ibm.com

Street price: $2517, 17-inch monitor $819

Polywell Poly5200MX8

PRO: Great graphics capabilities.

CON: Insufficient data to rate customer service.

VALUE: Best all-around deal.

Polywell Computers

800/999-1278, fax 415/583-1974

http://www.polywell.com

List price: $2500 (includes 17-inch monitor)

READER SERVICE NO. 756

Sony VAIO PCV-120

PRO: Good audio, video, and communications gear.

CON: No 17-inch monitor, yet.

VALUE: Good price for a loaded system.

Sony Electronics

800/476-6972

http://www.sony.com/pc

Street price: $2928 (includes 15-inch monitor)

READER SERVICE NO. 757

PHOTOGRAPHS: MARC SIMON

the best all-around MMX system of the three, and at $2500, the best value to boot. Extras include a Diamond Stealth 3D graphics card with 4MB of RAM, a large case, and a 17-inch Sampo monitor. About all that's missing is a modem—and sufficient reader feedback on Polywell's customer service.

As for performance, *PC World* lab tests showed all three systems to be faster than comparably equipped non-MMX systems. Improvements averaged about 7 percent with the PC WorldBench suite of Windows 3.1 and Win 95 office apps, 20 to 35 percent for professional graphics applications, and up to 50 percent for the MMX-specific version of Adobe Photoshop. The Polywell consistently edged out the IBM and Sony, with the Sony always slightly behind—maybe because it's the only system with a 256K secondary cache, as opposed to the 512K of the IBM and Polywell.

Yes, most of the first MMX-optimized software products will be for gamers and home users. But *PC World*'s tests found that even off-the-shelf business applications are speedier on MMX systems. The latest arrivals offer a welcome choice of features at very competitive prices.

—*Stan Miastkowski*

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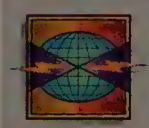
INTERNET



FOR MORE PRODUCT news and the latest announcements, check out the PC World Daily News Service at **http://www.pcworld.com/news.html.**

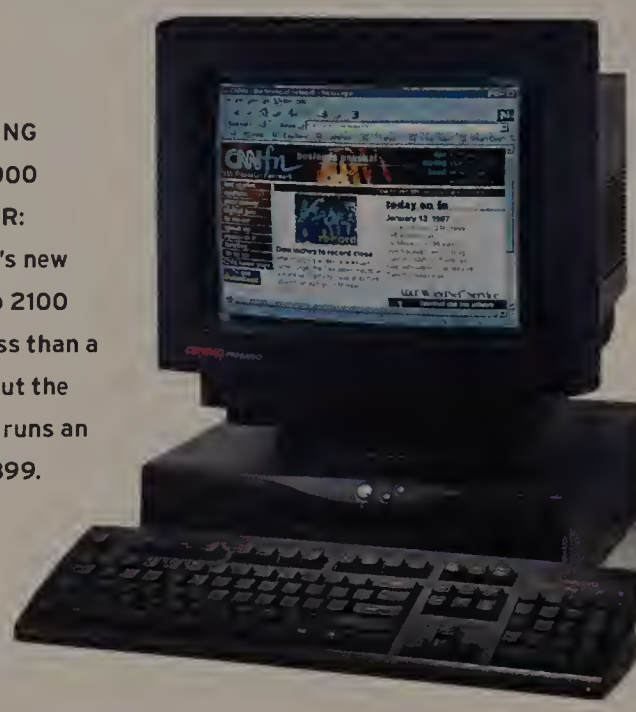
Compaq's $1000 PC: Desktop on a Diet

DESKTOP

DELIVERING a true home PC for under $1000 is a sort of Holy Grail for manufacturers. We are not talking about the infamous NC, or network computer (which is basically a gutted PC marketed as a terminal replacement), but a fully functional personal computer with plenty of memory, a good-size hard disk, and reasonable speed. Compaq is taking its shot with the new Presario 2000 series for first-time buyers or folks who want an inexpensive second system.

By our definition, the **Presario 2100**—the first system in the series—is not really under $1000; Compaq bends the rules by not including a monitor in the $999 price. Also, the Presario 2100's 133-MHz Cyrix Media GX processor—a new budget chip—should not be confused with Intel's 133-MHz Pentium: In our PC WorldBench tests, a prerelease unit performed at about the speed of an average P-75.

Nevertheless, the system is a good value, with 24MB of memory, a 2GB hard drive, an 8X CD-ROM drive, and a 33.6-kbps fax-modem. The 14-inch monitor costs another $399.



BREAKING THE $1000 BARRIER: Compaq's new Presario 2100 costs less than a grand—but the monitor runs an extra $399.

The Presario 2100 departs in a number of interesting ways from the typical Compaq configuration, color being the most obvious. Instead of the standard ivory, the Presario 2100's case is a nice-looking black—the chic color for home electronics these days. Compaq put in stereo speakers and a sleep button to suspend operation, but left out expandability: It has no open slots or bays and no Universal Serial Bus port. Peripherals such as internal tape drives and the new, inexpensive videophone devices must be connected to the parallel, serial, or game ports (there's only one of each).

For bundled software, Compaq went with standard home computer fare: Windows 95, Microsoft Works, Quicken SE, and a few games and online applications.

For a thousand bucks—or even $1400, including monitor—you can't go far wrong. I'd consider the Presario 2100 for a second home PC.

—*Tracey Capen* ▶

Compaq Presario 2100

PRO: PC sans monitor for around a grand.

CON: Can't add peripherals with adapter boards.

VALUE: Home user-friendly; power users need not apply.

Compaq Computer Corp.
800/345-1518
http://www.compaq.com
Street price: $999, monitor $399
READER SERVICE NO. 758

EDITED BY Yardena Arar and Laurianne McLaughlin

The Big Picture: Portable LCD Projectors

PRESENTATION

WHEN IT COMES to effective business presentations, let's face it: The Ross Perot kit—a long stick and pieces of pasteboard affixed with graphs—just doesn't cut it anymore. The slick, computer-generated graphics and custom video footage of modern sales presentations demand an appropriate showcase. And the impending arrival of DVD, with its near-broadcast quality video and five-channel stereo sound, will make high-quality presentation hardware even more important.

LCD projectors address this growing need, and several companies are preparing to grab the opportunity.

I was impressed with a pair of new projectors from Sharp and Sarif. Each one is small enough to fit under an airline seat, light enough to carry (under 16 pounds), compatible with both Macintosh and PC platforms, and capable of handling video signals in any of the three major international formats—NTSC, PAL, and SECAM.

SARIF'S UP: Compact, lightweight LCD projector makes a good traveling companion.

With a footprint of 15.3 by 10.4 inches, Sharp's **XG-NV1U NoteVision** may be small, but it can project a very big picture—from 32 by 24 inches (40 inches diagonal) to 20 by 15 feet (25 feet diagonal). The remote control doubles as a mouse and has a built-in laser pointer. A 16.7-million-color SVGA image projected from a Sharp notebook computer was crisp, bright, and colorful, even on the well-lit floor of the 1997 Winter Consumer Electronics Show.

Unfortunately, the composite and S-video inputs were not functioning on the prerelease version that I saw. Sharp says that the shipping version will also include a 3-watt stereo amplifier with SRS Surround Sound and speakers to add quality sound to the NoteVision's handsome images.

Sharp's NoteVision has a list price of $7995, about $300 more than a Sarif **Shuttle LT800N** with a built-in tuner and composite video inputs. (The list price for the data-only version of the Shuttle is $7195.) Sarif's Shuttle is also smaller and, at 13.9 pounds, lighter than Sharp's 15.4-pound NoteVision. And because the Shuttle operates in a vertical position, it has a tiny 6.5-by-9-inch footprint.

The Sharp projector's vertical design has two other advantages. First, the projection lens is elevated well above whatever else may be on the tabletop, so the image is less likely to be blocked. Second, the added height means the device is more likely to project straight ahead, rather than at an image-distorting upward angle that lower-profile projectors often need.

Sarif leaves out the S-video connector that Sharp plans to include. However, the Shuttle has a built-in cable-ready TV tuner, which Sharp omits. Tested with both an IBM 360CD ThinkPad running in 16.7-million-color mode and a Pioneer CLD-D604 laser disc player, the Shuttle projected a 47-inch picture from only 4.5 feet away—even without a zoom lens. That's larger than the zoom-equipped NoteVision's maximum image projected from the same distance. The Shuttle's picture was very good, but not quite as bright as the NoteVision's.

With other data/video projectors like Vidikron's Helios selling for as much as $14,000, both the Sharp and Sarif represent real value. While I like the NoteVision's brighter picture, convenient zoom lens, and cool bells and whistles such as the mouse control and built-in laser pointer, the Shuttle's built-in tuner, larger image, better price, and significantly smaller footprint make it a slightly better deal.

—Gordon Meyer ▶

Sarif Shuttle LT800N

PRO: Tiny footprint, cable-ready tuner, wide-angle lens.

CON: No zoom lens or S-video connector.

VALUE: Bargain choice for frequent travelers.

Sarif, Inc.
888/937-2743
http://www.sarif.com
List price: $7690

READER SERVICE NO. 759

Sharp XG-NV1U NoteVision

PRO: S-video input, zoom lens, SRS Surround Sound.

CON: No tuner.

VALUE: Solid contender from market leader.

Sharp Electronics Corp.
800/237-4277
http://www.sharp-usa.com/products/pro
List price: $7995

READER SERVICE NO. 760

SHARP IMAGE: The XG-NV1U NoteVision projects crisp, colorful pictures and costs less than $8000.

You've got *insurance* if Johnny crashes the *company car.*

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Insurance. It's a fact of life. But how often does your insurance agent give you money back? That's exactly what you can get right now when you buy a 2GB or 3200MB Ditto drive. Think of it as insurance for all the stuff on your PC: software, files, customer databases, delivery routes, everything. Which is why Ditto drives have become recognized as the industry standard, winning both PC World's Best Buy Award* and Mobile Computing's Peripheral Product of the Year. And with a $50 rebate, the Ditto drive is insurance you can't afford not to have because, hey, accidents can happen.

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HP ScanJet 5pse: Easy Fit, Easy to Use

SCANNER

ARE YOU IN A quandary over whether to get a cheap, compact sheetfed scanner or a more versatile, higher-quality flatbed? The new Hewlett-Packard **ScanJet 5pse** could push you off the fence.

Like its predecessor—the HP ScanJet 4P, a Best Buy in *PC World*'s January scanner roundup—the 5pse is a 24-bit, 300-dpi color flatbed scanner that produces consistently high-quality scans. Also like the 4P, the 5pse (sold in system bundles as the 5P) comes with a fine software array that includes Visioneer's PaperPort document and image manager, which incorporates Caere OmniPage LE 4.0 optical character recognition software; Corel's PhotoPaint 5 Select image editor; Corel's Web.-Designer authoring tool; and HP PictureScan 3.0.

But the $399 ScanJet 5pse is $100 cheaper and about 40 percent smaller than the 4P, which makes it perfect for the SOHO user with budget and space constraints.

What impressed me most about the shipping unit I reviewed was its smart design. A recessed area in the rear for attaching SCSI and power cables lets you place the unit flush against a wall, thereby saving even more desk space. A Scan button on the front panel launches the scanning software automatically, making the ScanJet 5pse as easy to use as a toaster.

On the downside, the ScanJet 5pse's scan surface is only 11.7 inches long, so you can't scan legal-size pages.

Although the ScanJet 5pse costs a bit more than flatbed scanners from vendors like Microtek, Plustek, and Umax, it's capable of producing scans as good as those generated by the ScanJet 4P—and better than the ones you'll get from sheetfed units. For top quality in a small scanner, the ScanJet 5pse is hard to beat.

—*Richard Jantz*

Hewlett-Packard ScanJet 5pse

PRO: Small footprint, push-button front panel, good software bundle.

CON: Short scan surface, expensive.

VALUE: Easy-to-use flatbed scanner produces sharp color scans.

Hewlett-Packard
800/722-6538
http://www.hp.com/GO/ScanJet
Street price: $399

READER SERVICE NO. 761

HP Gets Serious About Photos

PRINTER

IN OCTOBER, HP accompanied the launch of its 693C ink jet printer with much fanfare over its ability to produce near-photographic quality images. Curiously, however, the 693C did not come with software for managing and printing photos. Now the company is plugging the software gap, cutting the price, and repackaging the printer as the **DeskJet 694C.**

PHOTO FINISHER: HP's DeskJet 694C is similar to its 693C predecessor but has software to go with its photo printing capability.

The PC World Test Center's preliminary, informal tests show that the 694C is slightly faster—about 5 percent—than the 693C, which in formal testing we pegged at 1.7 pages per minute for text and 0.3 ppm for graphics. Like the 693C, the 694C's resolution is 600 by 300 dots per inch in black and 300 by 300 dpi in color, and it prints on the same paper types—letter and legal size, card stock, envelopes, transparencies, iron-on transfers, and continuous-feed banners.

HP estimates the new model's street price at $300, including a photo ink kit; the 693C when it first shipped cost about $50 more without the photo kit, which set you back an additional $50.

While the 693C's software was kid-oriented (it came with a special 101 Dalmatians graphics package created by Disney and HP), the 694C's HP Photo Project CD-ROM has far more adult appeal. Applications include Storm Technology's Easy Photo image editing software (which comes with a vast collection of photos) and Corel's Print House Select, a layout program with an extensive collection of Corel clip art, fonts, and stock photos. (The 694C without the Photo Project CD-ROM is distributed in system bundles as the 692C.)

Not everyone needs to print photographs, and many who wish to do so may find themselves discouraged by the price of HP's Photo Paper: $11.95 for 20 sheets. But if you need the best photos possible from a budget ink jet and have the cash for supplies, the 694C is a good bet.

—*Dan Littman* ▶

Hewlett-Packard DeskJet 694C

PRO: Includes photo printing software and photo kit.

CON: Expensive photo paper, no printed manual.

VALUE: A good deal if you need to print photos from an ink jet.

Hewlett-Packard
800/752-0900
http://www.hp.com
Street price: $300

READER SERVICE NO. 762

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[DICTIONARY OF THE FUTURE, PAGE 531]

lost (lôst) ***adj.*** [archaic] **1.** unable to locate one's position, as in, "Help. I am lost." **2.** having no sense of direction at all **n.b.** became obsolete in 1996 with the introduction of Street Atlas USA 4.0 and Tripmate.

Circle 37 on reader service card

Mobile Muscle: MMX Notes From Gateway, IBM

NOTEBOOK

THEY'RE THE NEW tough kids in the neighborhood, faster and more powerful than any portables around. They're the latest additions to a growing gang of Pentium MMX-166 notebooks. Early arrivals—Micron's TransPort XPE and Toshiba's Tecra 740—set a high standard, but Gateway's **Solo 2200 S5-166** and IBM's **ThinkPad 760XD** are worthy contenders.

We tested a shipping unit of the $5024 Solo configured with 40MB of memory, which bullied its way into the top ranks of Pentium MMX-166 notebooks with a PC WorldBench score of 218. That isn't the highest score we've seen—the Micron prototype, with 32MB of RAM, beat it by 3 points—but it's almost 18 points higher than the score of its cousin, the Solo 2100 S5-150, a Pentium MMX-150 with 40MB of RAM.

THINK MMX: The ThinkPad 760XD offers MMX technology and the IBM label—for a price.

In addition to all that RAM, Gateway packs its portable with an array of top-notch components: a beautiful 12.1-inch active-matrix screen, a spacious 2.1GB hard drive, and all the hip multimedia features. As if this system doesn't have enough muscle, Gateway anticipates selling most Solo 2200s in the company's Best Buy configuration, which includes 80MB of memory, for $5399.

We didn't test our prerelease unit of the IBM ThinkPad 760XD, but we expect the shipping version to offer the same quality as its less-powerful siblings in IBM's ThinkPad 760 series. The $6200 unit includes 32MB of RAM, a 12.1-inch active-matrix screen, a 3GB hard drive, an 8X CD-ROM drive, and 1MB of video RAM. By the time you read this, Big Blue also expects to be shipping the ThinkPad 760XL, which will cost $300 less for a smaller (2.1GB) hard drive, 16MB of memory, and no CD-ROM drive.

ThinkPad loyalists won't blink at these high price tags because of IBM's reputation for building industry-standard notebooks. But more cost-conscious buyers should consider Gateway's Solo line, which offers excellent quality—not to mention enormous amounts of memory—for less money.

Bear in mind that these are just the latest members of a formidable new notebook gang. Expect to see more soon from other companies, including Hitachi, NEC Technologies, and Texas Instruments.

—*Allyson Bates* ▶

SPEEDY SOLO: Gateway's new Solo 2200 S5-166 joins the Pentium MMX portable pack.

Gateway Solo 2200 S5-166

PRO: Great performance, loads of RAM, attractive display.

CON: Not as fast as other Pentium MMX-166 notebooks.

VALUE: Fast, affordable notebook with quality components and options.

Gateway 2000
800/846-2000
http://www.gw2K.com
Street price: $5024

READER SERVICE NO. 763

IBM ThinkPad 760XD

PRO: Large hard drive, great quality notebook.

CON: Expensive.

VALUE: IBM reputation commands a premium.

IBM Corp.
800/426-2968
http://www.pc.ibm.com
Street price: $6200

QUICK TAKES

Red Alert

The FBI says more than 90 percent of stolen computer equipment is never recovered. But a thief might think twice about snatching your notebook PC if it has Port's Defcon 1 security alarm screaming from it. Roughly the size of a compact cellular phone, the $49.95 Defcon 1 attaches to a carrying case or inserts into a security lock slot and emits a 110-decibel howl if anyone so much as turns the notebook over. If you accidentally bump it, a three-beep warning gives you ample time to disable the alarm before the noise wakes the neighbors. The Defcon 1 runs on a 9-volt battery that can't be yanked when the alarm is engaged. Port, Inc., 800/242-3133, http://www.portinc.com.

READER SERVICE NO. 764

Bargain Port Replicators

Port replicators, which let you instantly connect your notebook to external keyboards, monitors, printers, and other peripherals, are handy gadgets—but they always seem outrageously priced. Now Xtend Micro Products is selling simple, relatively inexpensive port replicators for several popular notebooks. The shipping unit we received, for use with a Toshiba Satellite Pro notebook, was solidly built and color-matched. It had only the essential ports—power, parallel, serial, keyboard, mouse, and video; Toshiba's own port replicator includes PC Card slots and audio connections. But at $150 (street), the Xtend is a lot cheaper than the $400 Toshiba replicator. If you need only the basics, the Xtend PortReplicator is a good deal. Xtend Micro Products, Inc., 800/232-9836, http://www.xmpi.com.

READER SERVICE NO. 765

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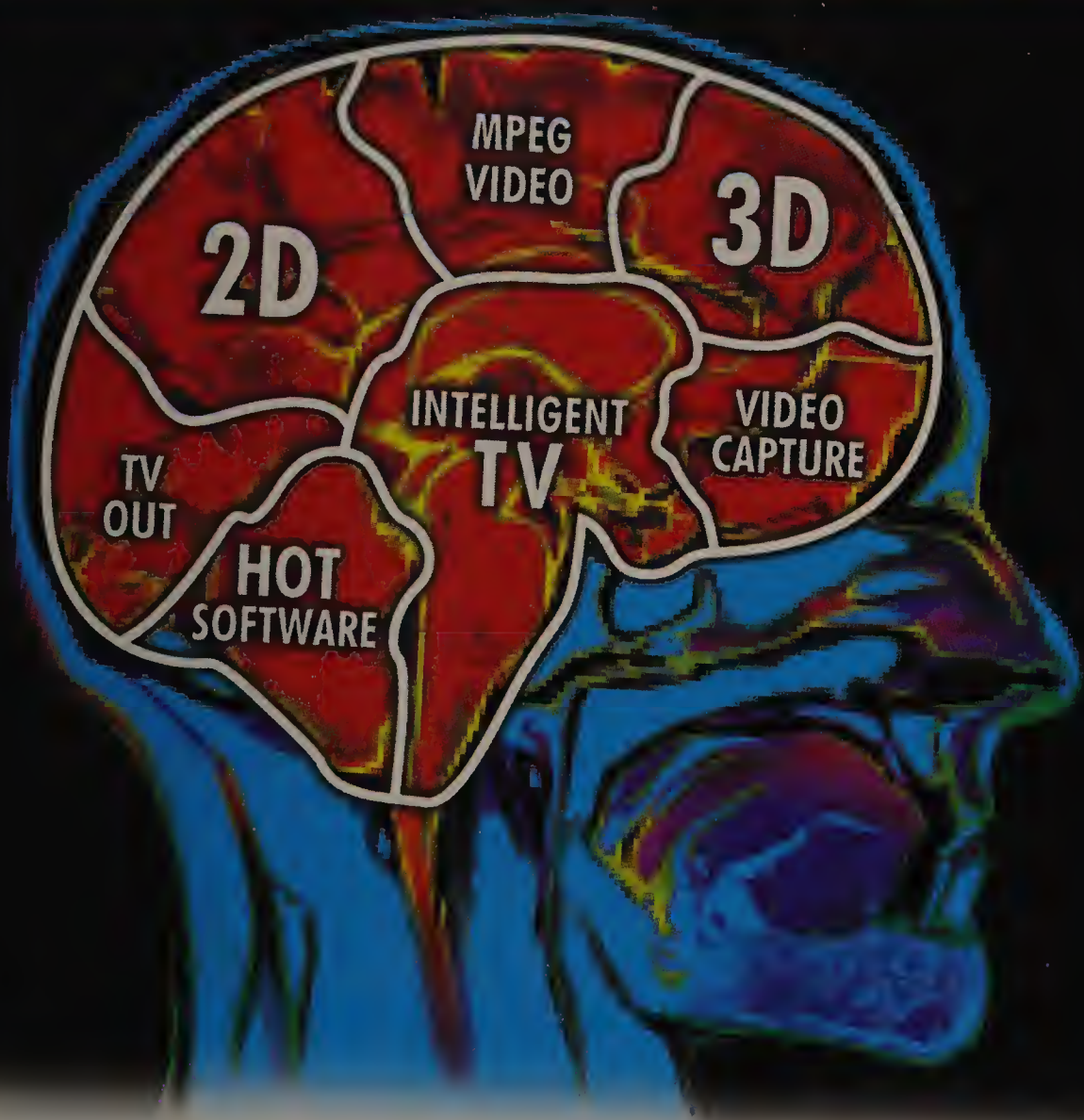

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*Estimated street price for the 2MB upgradable version.

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Now You See It.™

ATI

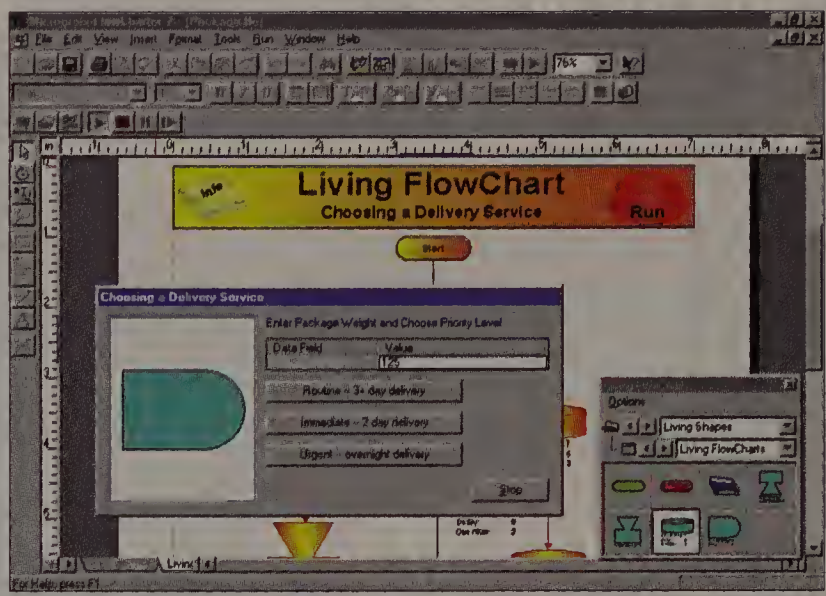
Picture This: Micrografx Graphics Quartet

GRAPHICS

GRAPHICS SOFTWARE packages, like word processors and spreadsheets before them, have gone the way of the suite. Witness Micrografx's **Graphics Suite 2**, which includes solid flowcharting, drawing, image editing, and 3-D illustration programs along with a cornucopia of clip art, photographs, and fonts.

Contented users of Corel's similar CorelDraw suite probably won't be tempted to switch, but Graphics Suite 2 is an attractive option for first-time graphics bundle buyers—and an economical one. Its $350 price is *half* that of CorelDraw 7; the $150 upgrade price is $100 less than CorelDraw's and is being offered to owners of Microsoft Office as well as other graphics packages.

The most striking difference between Graphics Suite 2 (which I tested in prerelease form) and CorelDraw is Graphics Suite 2's FlowCharter 7 application; CorelDraw has no equivalent module. Like Visio Corp.'s Visio, Micrografx's FlowCharter 7 lets you piece together flowcharts and other business diagrams from ready-made objects, but FlowCharter 7 departs from the competition with its new and innovative Living FlowCharts feature. A Living FlowChart isn't just a static diagram: Every object within the chart can present wizard-style dialog boxes that allow you to enter data or push buttons to affect the path of the flowchart.



LIVING FLOWCHARTS walk you through decision-making processes.

Graphics Suite 2's other modules have also undergone renovation. Designer is a capable vector-illustration tool; it doesn't match all the new features in CorelDraw 7 (such as the ability to create semitransparent objects), but it has some unique new offerings of its own. Megagons and Curvygons, for example, are addictive drawing tools that let you create spectacular Spirograph-like geometric patterns.

If you're designing Web pages, you'll also appreciate Designer's estimates of how long it will take to download images in different file formats and at varying modem speeds. The formula used to calculate download speeds obviously cannot factor in particularly bad Net lag, but it does assume moderate traffic.

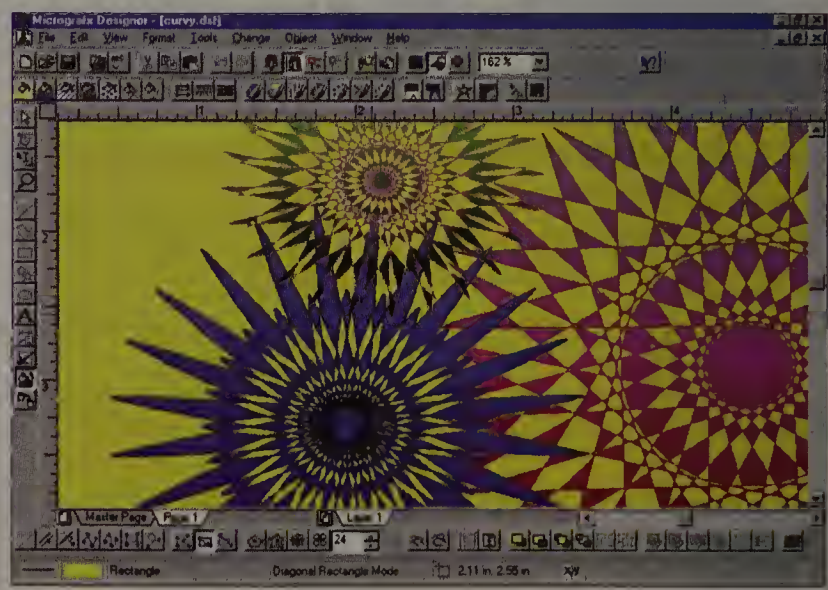
Picture Publisher, Graphics Suite 2's image-editing module, has added some terrific special-effects wizards for common tasks, including one for removing red eye from digitized photographs. Picture Publisher also includes a refined version of its remarkable Command Center, which puts ordinary Undo commands to shame by allowing you to selectively remove effects that were applied many steps ago.

Graphics Suite 2 also adds Simply 3D, an entry-level three-dimensional graphics application that represents a major improvement over the rudimentary Instant 3D utility included in the suite's first release.

Graphics Suite 2 is a Microsoft Office–compatible application, which gives it such capabilities as Visual Basic–compatible scripting and the ability to share Office's spelling dictionary. But don't assume the suite will be a cinch for Office users to master: The interface isn't really a close copy of Office's, and it is less polished than CorelDraw's. FlowCharter and Designer, for instance, place some of the same commands in different menu locations.

Indeed, despite their wizards and templates, both the Micrografx and Corel graphics suites are best suited to serious users who can invest time in mastering them. If you're truly a graphics neophyte, you'll probably be happier with Micrografx's $50 Windows Draw, a streamlined package with tools that are easy to learn and use.

—*Harry McCracken* ▶



SHADES OF SPIROGRAPH: New tools in Graphics Suite 2's Designer let you draw complex geometric patterns in a flash.

Micrografx Graphics Suite 2

PRO: Includes flowcharting program and improved 3-D graphics application, Web download time estimates.

CON: Still not for beginners, some interface quirks.

VALUE: Powerful graphics for less money than CorelDraw.

Micrografx
800/371-7783
http://www.micrografx.com
Street price: $350, competitive upgrade $150

READER SERVICE NO. 766

What a concept! You want blistering Hot Graphics Performance? Build it into the Hardware.

You'll find the same advanced ATI 3D technology in hot new systems from IBM, Sony, NEC, Gateway, Acer and many other leading manufacturers.

SUPERIOR HARDWARE ACCELERATION	ATI 3D XPRESSION+ PC2TV	MATROX MYSTIQUE
BI-LINEAR TEXTURE FILTERING	■	
FOG EFFECTS	■	
PERSPECTIVE CORRECT TEXTURE MAPS	■	■
TRANSPARENCY (ALPHA BLENDING)	■	
TRUE COLOR VIDEO IN ANY MODE	■	

We pack more advanced features into hardware than anyone else.

ATI 3D RAGE™ II Accelerator
Powerful 64-bit 3D and 2D graphics performance for lifelike 3D detail and amazing realism

ATI PC2TV
High-quality TV out display up to 800x600 resolution, for presentations, gaming or recording output to a VCR

Superior 3D Acceleration
We put more 3D support in hardware than Matrox[1], with critical features including bi-linear filtering, perspective correct texture mapping, fog effects and more

*Upgradable Memory**
Upgrade to 4, 6 or 8MB for higher resolutions, greater color depth and more 3D detail with added 3D textures

All This And More
ATI 3D accelerators start at just $169[3]

ATI Multimedia Expansion
Upgrade to powerful, low cost options such as the ATI-TV™ tuner

Amazing Video Quality
Smooth, full-screen, full-motion video playback in 16.7 million colors regardless of graphics mode – not available from Matrox[2]

Our exclusive PC2TV feature uses your big-screen TV as a monitor for in-your-face gaming and riveting presentations. Or send output directly to your VCR.

Experience visibly superior full-screen, full-motion MPEG video playback† either with Windows 95 or Windows 3.1x.

*ATI 3D PRO TURBO PC2TV (4MB upgradable or 8MB) delivers high-end 3D, 2D and video performance, and comes with Extreme 3D. Or choose ATI 3D XPRESSION+ PC2TV (2MB upgradable to 4MB) with today's hottest 3D games and VRML web browser software free. Both products support the incredible ATI-TV add on card - the best TV tuner and video capture card.

It only makes sense - the more features you build into your hardware, the more performance you get back out. So we engineered more advanced 3D, 2D and video right onto our graphics accelerator upgrade cards than Matrox or Diamond. So you get stunning speed and a dazzling display. The kind you need to bring out the absolute best in both appearance and performance, whether it's for business presentations, games, multimedia or the web. See your dealer today. Get more details at **www.atitech.com**. Or call us at 905 882-2600 (press 2 for faxback).

Designed for Microsoft Windows 95

PC WORLD BEST BUY · ★★★★ RATED NEXT · ★★★★ RATED BYTE

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COMPUTER CITY 1-800-843-2489 · EGGHEAD 1-800-344-4323 · MICRO CENTER 1-614-850-3000 · WIZ 1-800-253-0186

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SII Seiko Instruments

*Available at**: CompUSA at 1-800-COMPUSA, Computer City at 1-800-THECITY, Elek-Tek at 1-800-395-1000, OfficeMax at 1-800-788-8080, Fry's Electronics, PC & Mac Connection at 1-800-800-1111, MicroWarehouse at 1-800-367-7080, MacWarehouse at 1-800-255-6227, Global Computer Supplies at 1-800-8GLOBAL, Inmac at 1-800-972-3212, MISCO/Power Up at 1-800-876-4726, CDW at 1-800-800-4239, or Dartek at 1-800-832-7835. *Smart Business Card Reader available at CompUSA, Elek-Tek, and PC mail order catalogs.

You will be required to fax proof of purchase. Call 1-800-424-9713 for more details or the dealer near you. Product must be purchased between March 28 and April 20, 1997. This offer is not valid for product purchased for resale. One claim per unit purchased. Offer good in the U.S. only. All requests must be placed before April 20, 1997. Flowers will be shipped by April 22, 1997. Seiko Instruments is not responsible for late shipments or misdirected claims. Proof of purchase must clearly state the following: purchase date, dealer name and location, product purchased, and purchase price. Not valid with any other offer. Offer expires on April 20, 1997. Seiko Instruments reserves the right to rescind and/or change the promotional offer at any time. On the Web at: www.seikosmart.com

Circle 188 on reader service card

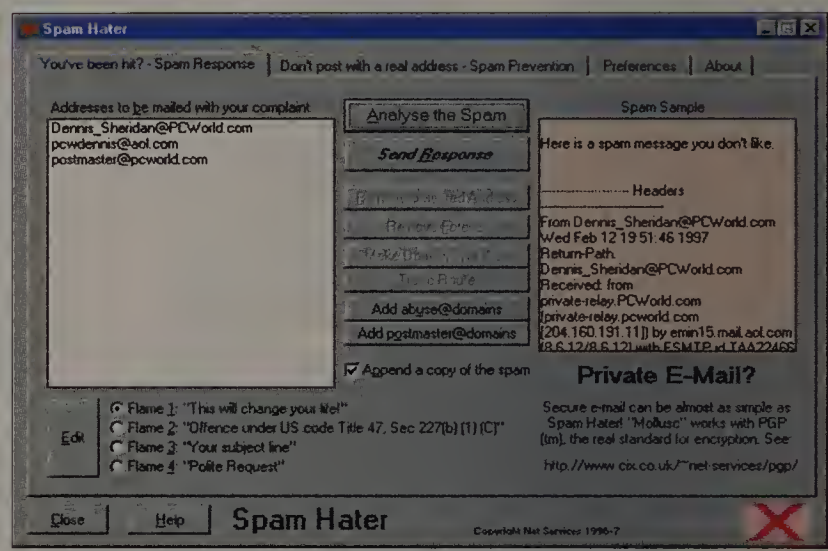
Spam Hater: Freeware Helps You Flame Junk Mailers

FREEWARE

IF THERE'S ONE thing most Internet users detest more than *spam*—unsolicited e-mail that typically contains get-rich-quick schemes, silly advertising, or worse—it's not being able to fight back. If you send a straightforward reply, it generally bounces back with an "Undeliverable Mail" message, and the junk keeps coming.

But now there's free help available. **Spam Hater,** freeware from Net Services of Great Britain, prevents spammers from hiding behind blind return addresses by determining the true source of any e-mail message, including the sender's address and Internet service provider. You can then complain not only to spammers but also to their ISPs, which may be more effective: Many ISPs will banish habitual spammers.

Using Spam Hater is easy. Open the spam, launch Spam Hater, tell it what e-mail program you're using, then hit the *Analyse the Spam* button. A list of all addresses the e-mail message went through will appear in a window.



SPAM SLEUTH: Spam Hater identifies the source of junk e-mail.

But now there's free help available. **Spam Hater,** freeware from Net Services of Great Britain, prevents spammers from hiding behind blind return addresses by determining the true source of any e-mail message, including the sender's address and Internet service provider. You can then complain not only to spammers but also to their ISPs, which may be more effective: Many ISPs will banish habitual spammers.

Using Spam Hater is easy. Open the spam, launch Spam Hater, tell it what e-mail program you're using, then hit the *Analyse the Spam* button. A list of all addresses the e-mail message went through will appear in a window.

You can respond in your own words, or you can use one of the program's prepared messages, which range from a polite request to some pretty coarse–if imaginative–insults (example: "To repent, you must be Pat Buchanan's love slave"). You can even send your reply anonymously.

Spam Hater supports most popular e-mail programs. You can download it from *PC World*'s shareware library at http://www.pcworld.com/software_lib.

With Spam Hater on my desktop, I can hardly wait for my next spam.

—*Dennis Sheridan* ▶

Spam Hater

PRO: Effective, easy, free.

CON: Documentation and help files could be better.

VALUE: Superb!

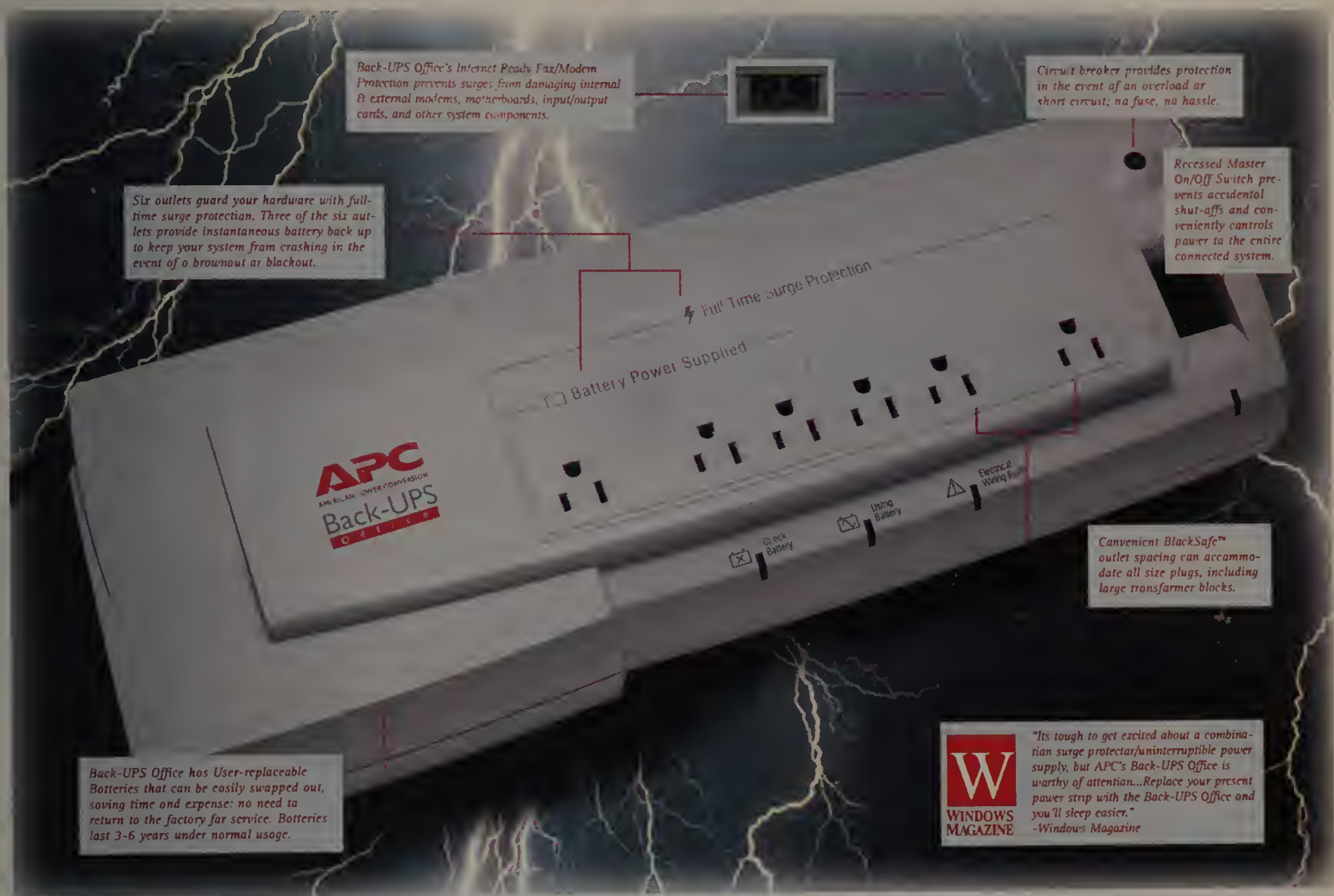
Net Services

011-44-1242-580293

http://www.compulink.co.uk/~net-services/

Street price: Free

"They thought my new multipath Back-UPS® Office™ was just a big surge suppressor – then the lights went out."

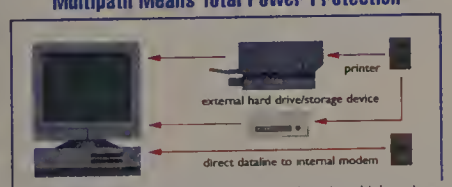


At last, a safe place to plug everything: multipath Back-UPS Office for workstations, PC's and peripherals

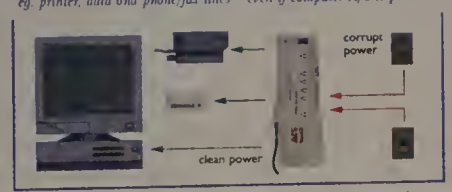
Power problems attack computers relentlessly. Did you know that you have a better chance of winning the lottery than of escaping power problems? They are the single largest cause of computer data loss and hardware damage.

Back-UPS Office provides clean, reliable power for your entire system. Instantaneous battery backup ensures uninterrupted operation of your CPU, monitor and an external storage device. Full-time surge suppression and site-wiring fault protection spreads a true multipath safety net under any remaining peripherals, like modems, printers, faxes and phone systems. Back-UPS Office also provides convenient BlockSafe™ outlet spacing to handle all size plugs – even large transformer blocks.

Multipath Means Total Power Protection



Bad power (red) can enter a computer system through multiple paths – eg. printer, data and phone/fax lines – even if computer A/C is protected.



The Multipath protection of Back-UPS® Office™ shields your peripherals and guards your computer from bad power on every path, providing clean, safe power (green), to your entire system.

Unique multipath protection keeps your PC and data safe

Plugging phone lines or other peripherals into your computer increases your vulnerability to power problems. When a surge hits an unprotected peripheral, it can blaze down serial cables and datalines, and toast your expensive PC. Multiple peripherals and datalines to and from your system are vital, but dangerous. Without them you can't do your job. If a power sag locks your keyboard or reboots your computer before you've saved work, or while you are downloading from the Internet, you can lose data, time and money. Don't spend another late night at the office to meet your deadline. Join over 6,000,000 computer users worldwide who prefer APC to protect hardware and data.

Back-UPS Office protects your entire system

Until now, protection for your entire system required several devices. Back-UPS Office means clean, safe power to every peripheral, and instant battery backup to keep your system from crashing. It means protection for less by integrating the security of a surge suppressor with the power of a UPS, guaranteed up to $25,000.

LIFETIME EQUIPMENT PROTECTION $25,000

FREE!

Just fax or mail this coupon to APC for your FREE 60-page Power Protection Handbook and learn the 10 "Do's and Don'ts" of protecting your workstation.

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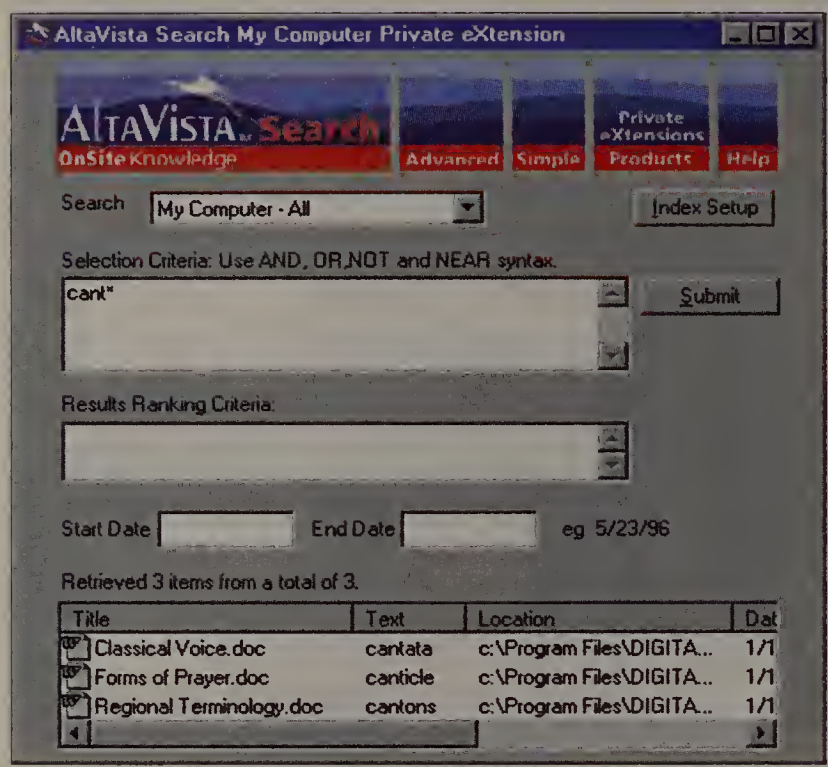
Circle 45 on reader service card

The Search Is On: AltaVista for the Desktop

SEARCH UTILITY

NOW, WHERE DID you save that e-mail inviting you to a chamber-music recital? Isn't the concert tonight? The message must be somewhere on your hard drive, along with 10,000 other files. But wait: You could find it easily with **Search My Computer Private eXtension 1.0,** a utility based on AltaVista, the search engine that tamed the Web.



ALL NEEDLES, NO HAY: Search My Computer PX brings to your local system all the detective power of AltaVista's Web search engine.

Upon installation, Search My Computer PX indexes text in files created by a number of applications—word processors, e-mail, spreadsheets, presentation software, and more (but not desktop publishing programs such as PageMaker or QuarkXPress). This index, updated automatically according to a schedule you set, allows Search My Computer PX to scream past the text-search option of Windows' Find utility: A search of my P-90's too-full 800MB drive was essentially instantaneous. Indexing is also fast—less than 3 minutes on my system.

Search My Computer PX runs as an add-on to either Netscape Navigator or Microsoft Internet Explorer—like doing an AltaVista search without visiting the site—or as a stand-alone executable. Once you locate a file, you can view it using either the application that created it or the Quick View utility that Microsoft licensed from Inso.

At least two software dealers are bundling Search My Computer PX with Inso's full Quick View Plus 4.0 (see "Best Ways to Browse the Web") for $59. Alone, Search My Computer PX goes for $30—that's cheap for software that tracks down everything from invitations to invoices in seconds.

—Dan Littman

Search My Computer Private eXtension 1.0

PRO: Sophisticated search capabilities, very fast, easy to use.
CON: Weak documentation.
VALUE: A very useful tool.
AltaVista Internet Software
800/336-7890
http://altavista.software.digital.com/
Street price: $30, Quick View Plus 4.0 bundle $59
READER SERVICE NO. 767

Take a Letter: PC Dictation Gets Cheaper

VOICE RECOGNITION

DICTATION IS finally coming to the masses, with the introduction of brawny dictation products for $100 or less by major players in the what-you-say-is-what-you-see market.

Kurzweil Applied Intelligence's **VoicePad Pro** is a $50, voice-enabled version of WordPad, the bare-bones word processor included with Windows 95. Dragon Systems' **DragonDictate Singles,** $100 each, let you dictate into one of five popular off-the-shelf applications—Microsoft Word and Excel, Corel WordPerfect, and Lotus 1-2-3 and Notes With cc:Mail. Each DragonDictate Single also supports Netscape Navigator and WordPad.

VoicePad Pro and DragonDictate Singles are scaled-down versions of larger, more expensive products only in the sense that they don't support multiple applications.

Voice recognition in both programs is very accurate. This is one instance when a manufacturer's claim of 90 percent accuracy is 100 percent accurate. Both programs work straight out of the box; you don't need to "train" them to recognize your speech.

Speed is still an issue. You must use *discrete speech,* meaning you must pause between words. I found actual dictation speeds to be closer to 30 words a minute than the 60 that's advertised by the manufacturer. In other words, don't lay off your stenographer just yet.

Unlike VoicePad Pro, DragonDictate works with off-the-shelf apps, but both are commendable for people who haven't learned to type or who can't use a keyboard because of disabilities. At last, the common PC user can be a dictator.

—John P. Mello Jr. ▶

DragonDictate Singles

PRO: Compatible with off-the-shelf applications.
CON: Slow speech recognition.
VALUE: Affordable voice recognition for popular applications.
Dragon Systems
800/825-5897
http://www.dragonsys.com/
Street price: $100 each
READER SERVICE NO. 768

Kurzweil VoicePad Pro

PRO: Excellent speech recognition.
CON: Supports only Windows 95's WordPad.
VALUE: Dictation everyone can afford.
Kurzweil Applied Intelligence
800/380-1234, 617/893-5151
http://www.kurzweil.com/
Street price: $50
READER SERVICE NO. 769

HP SureStore CD-Writer

Solid engineering.

High performance.

Broad acceptance.

That's our drive.

The new HP SureStore CD-Writer 6020es

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Introducing the new HP SureStore CD-Writer.

It's a fast paced world. To succeed, you have to make an impression. And there's no better way to make an impression than on CD using the new HP SureStore CD-Writer 6020 CD-Recordable drive. CD-Writer lets you ❶ record awesome multimedia presentations to take on the road. Or ❷ deliver CDs to clients and others with total confidence that it can play in millions of CD-ROM readers worldwide.

The robust software suite included with the CD-Writer lets you ❸ copy all your drafts to CD quickly and easily. And files stored on CD can be retrieved in seconds. It's ideal for ❹ creating permanent archives of your files. What's more, CD-Writer can ❺ make custom audio CDs that can be played on stereo CD players at home or in the car. CD-Writer is also a 6X* CD reader so it can ❻ play all your CD-ROMs smoothly. Now we're cruisin'.

Given all the things you can do with the HP SureStore CD-Writer, what's your drive? Check it out. Visit your reseller or call 1-800-826-4111 ext. 2268. Or you can steer toward the web and find HP SureStore CD-Writer at www.hp.com/go/cdr.

HEWLETT® PACKARD

*Actual speed may vary according to application used

Digital Video Editing on a Budget

VIDEO EDITING

IF THE HIGH PRICE of software has kept you from editing your own videos, a pair of new products may be just what you've been waiting for. Priced at only $99 each, **Corel Lumiere Suite** and **Presto Multimedia Suite** provide creative features comparable to those previously found only in video editing packages costing $350 and up. Neither product offers all of the professional features found in high-end packages such as Adobe's $750 Premiere. But both let you create and edit videos for multimedia presentations, training demos, Web pages, and other dynamic projects—at a fraction of what it used to cost.

I installed a beta version of Corel Lumiere and a shipping version of Presto Multimedia on a Pentium-90 with 16MB of RAM, a MiroVideo DC10 capture board, and a Pro Audio Spectrum sound card. Of the two suites, Lumiere is the hands-down winner in performance, features, and overall value. As a 32-bit application suite, Lumiere harnesses the power of Windows 95 or NT, while five of Presto Multimedia's six components are 16-bit programs.

Corel Lumiere Suite gives you a lot for your $99: the Lumiere 1.0 video editor, Photo-Paint 6.0 image editor, Motion 3D 7.0 text and object animator, and—not surprisingly, coming from Corel—a truckload of royalty-free video, music, and sound clips, plus photos, images, and fonts.

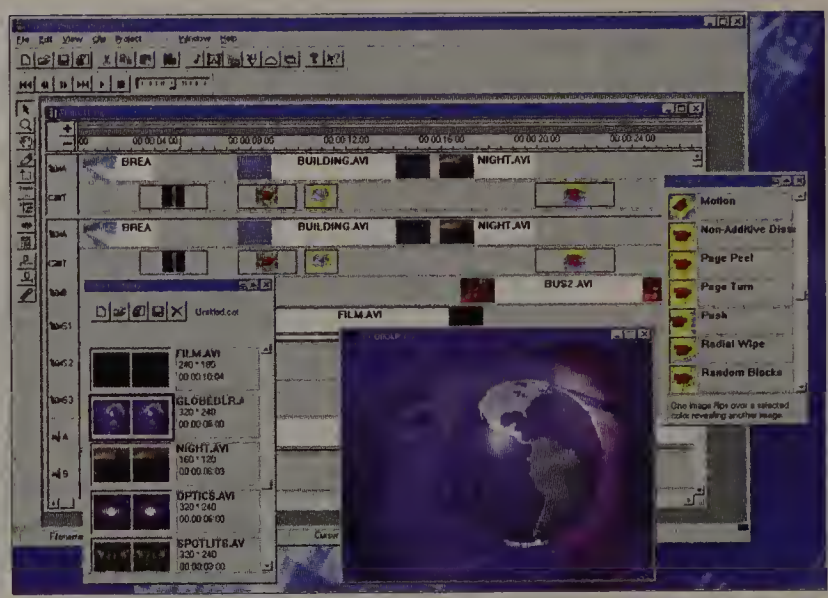
Like Adobe Premiere, Corel Lumiere employs a timeline image to display multiple tracks of video and audio clips. You can easily drag and drop clips and mix them into new arrangements, apply a variety of transitions and special effects, and save your final creations as new video clips. Learning to do all this can take time, but Lumiere comes with a good tutorial, an on-screen help system, and lots of preset options—built-in transitions, special effects, music, and sound effects—which make it easier to get things going.

The Presto suite also contains a bundle of applications and media clips, and Presto VideoWorks—the video and audio editing component—also has timeline-oriented tools. Also included are an image editor, media player, scanning utility, and Kai's Power Goo SE, a thoroughly fun image-distortion program.

There's no tutorial or demo files, nor preset options, and the on-screen help isn't nearly as good as Lumiere's. Still, Presto is worth considering for Windows 3.*x* users.

Be sure the product you buy works with the files you'll want to use. Neither suite's video editor supports MPEG video or MIDI sound files, and Presto VideoWorks doesn't support QuickTime .mov files.

—*Richard Jantz* ▶



LET THERE BE LUMIERE: Corel's $99 video editing suite includes features previously available only in far more expensive packages.

Corel Lumiere Suite

PRO: Powerful digital video editing, inexpensive, huge clip media library.

CON: Takes time to learn, lacks support for MPEG files.

VALUE: Cool videos, cheap price, case closed.

Corel Corp.
800/772-6735
http://www.corel.com
Street price: $99

READER SERVICE NO. 771

Presto Multimedia Suite

PRO: Basic digital video editing, inexpensive.

CON: No tutorial, video editor lacks support for .mov and MPEG.

VALUE: Decent video editing for Windows 3.*x* users.

NewSoft Inc.
800/436-4365
http://www.tophat.com
Street price: $99

READER SERVICE NO. 772

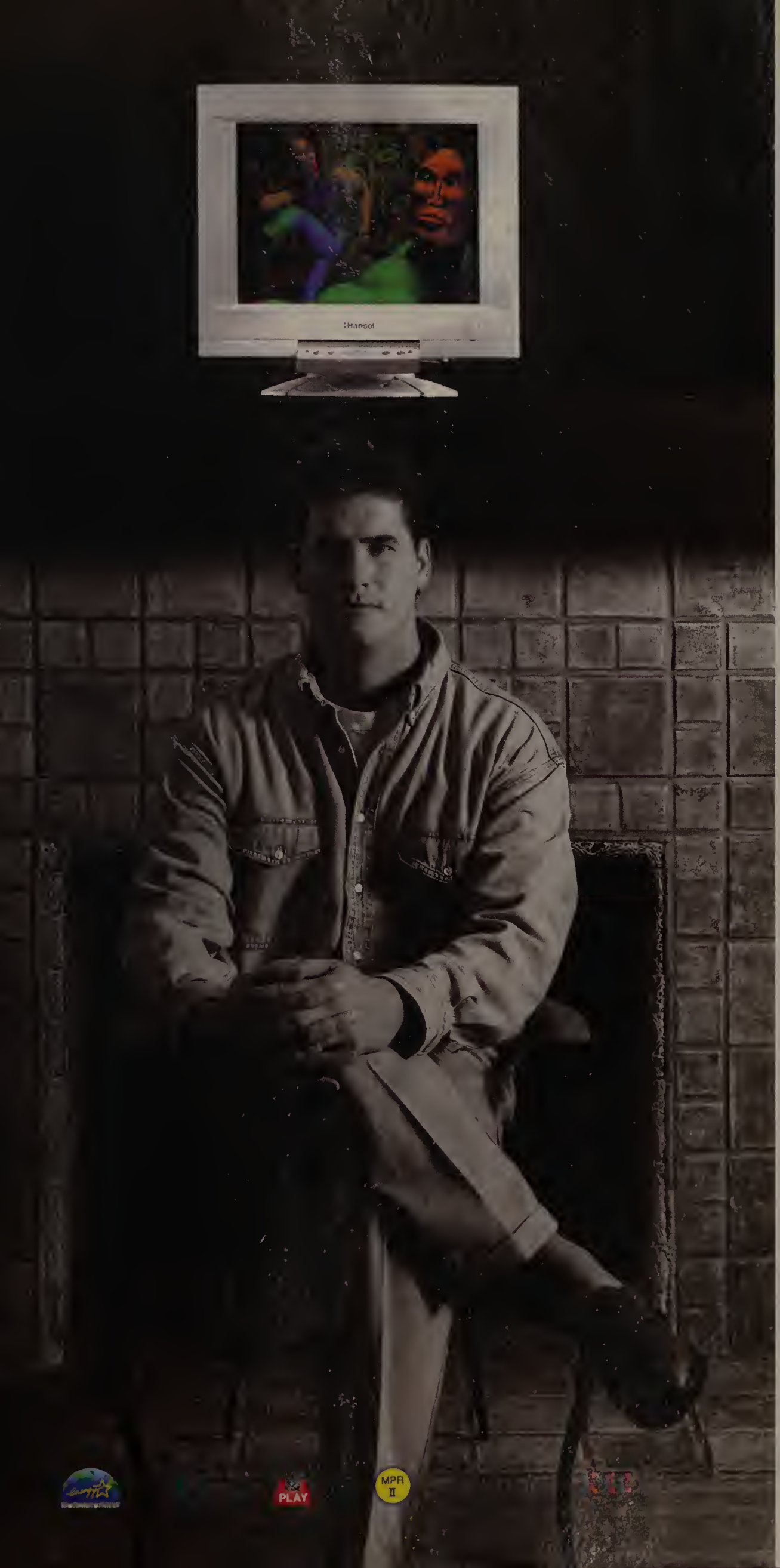
PRESTO CHANGO: For less than $100, Windows 3.*x* users can add special effects and other flourishes to video presentations.

QUICK TAKES

Xerox's All-in-One

Xerox revisits the multifunction device with the **Document WorkCentre Pro 535.** Street-priced at $1000, the compact printer/copier/fax combo costs almost twice as much as its predecessor, the Document WorkCenter 250, which earned *PC World's* Best Buy rating in October. But the 535 replaces the 250's ink jet with a 4-page-per-minute, 300-dots-per-inch laser printer. Unfortunately, Xerox stuck the 535 with an old-fashioned 9600-baud fax-modem. With an optional memory upgrade, the 535 can send faxes or receive faxes into memory while it's printing. Xerox, 800/334-6200, http://www.xerox.com

READER SERVICE NO. 770



Mike Latschislaw finally found a monitor as good as the games he designs.

Over at the JVC games division they look to Mike Latschislaw to make their games come alive. But while he's doing it, Mike looks to something else. The new 17PX monitor from Hansol.

Because according to Mike, no other monitor sets up as easily, has as many controls (20 on-screen settings), is as practical to use, and with its radical, modern design, is just such a pleasure to look at.

So next time you've got a game on the screen, think of the guy who designs them. Then think of the monitor he uses. The new 17PX from Hansol.

Because when it comes to monitors, Mike doesn't play games.

Ideas that Shine

Hansol

For further information, call toll-free
1-888-HANSOL1(1-888-426-7651).
Hansol Multitech, Inc.,
6 Centerpointe Dr., Suite 220,
La Palma, CA 90623

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Circle 102 on reader service card

Surfing from Main Street to Wall Street!

MAX CAN DO IT!

CyberMax

CyberMax knows that when it comes to surfing the Net, there are no boundaries. Today, the Internet is fast becoming a tool for both household productivity and business prosperity. It's comprehensive, colorful and most importantly, easy to use.

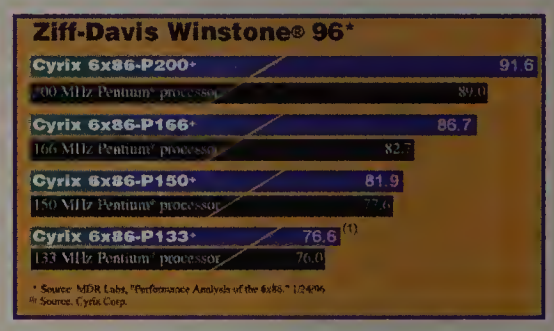
Yes NetWare.

It's even giving people who were once intimidated by computers a reason to smile. Experience for yourself everything the online world has to offer with CyberMax.

Power Surges

Surfing the Net takes on a whole new dimension with systems powered by the Cyrix 6x86 and AMD K5-PR166 processors. Cyrix has designed "plug-in compatibility" for future 6x86 processors. Advanced multimedia (MMX) capabilities and other powerful architectural features will increase the performance of future processors—processors that will be socket compatible with the CyberMax system you buy today. The new AMD K5-PR166s are sure to deliver the best value for home productivity, Web connectivity and entertainment.

Cyrix 6x86



The Cyrix 6x86 processor series outperformed the competition with superior Winstone 96 scores across the board.

AMD

Standard on All CyberMax systems: 2 high-speed serial (16550), 1 parallel (bi-directional) and 1 game port.

"The CyberMax 6x86...is the most well-rounded configuration in the group for the price."

COMPUTER SHOPPER December 1996

PC MAGAZINE *"...The huge hard disk, great performance, and excellent documentation add up to a bargain."* December 1996

COMPUTER SHOPPER August 1996 *"Living up to its promise,...the CyberMax 6x86 Cyrix Series P166+ smoked our benchmark system in virtually every test."*

Max I8-PP200 $2649
Intel Pentium™ Pro Processor — DO301

- Intel 200 MHz Pentium® Pro Processor
- 32MB EDO RAM w/256K Pipeline Burst Cache
- STB Velocity 3D Video Card w/8MB VRAM
- 4.0GB Hard Drive, 1.44MB 3.5" Floppy Drive
- 12x CD-ROM, Ensoniq Wavetable Sound Card
- 33.6Kbps Fax/Modem w/Voice Mail & Speakerphone
- 17" Princeton Graphics EO .28 dp (15.8"VA) Monitor
- Altec Lansing ACS400 Speakers & ACS250 Subwoofer
- 104-Key Keyboard, Microphone & MS PS/2 Mouse
- Microsoft Windows 95 w/MS Plus, CyberSpace Pack
- Family/Office Multimedia CD Bundle (Preinstalled)
- ATX Tower Case w/ 2 fans
- Limited 3-Year Warranty w/ In-Home Service

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- Intel 200 MHz Pentium® Processor w/MMX™
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- 4.0GB Hard Drive, 1.44MB 3.5" Floppy Drive
- 12x CD-ROM, Ensoniq Wavetable Sound Card
- 33.6Kbps Fax/Modem w/Voice Mail & Speakerphone
- 17" Princeton Graphics NI (16.1"VA) Monitor
- Altec Lansing ACS90 Speakers & ACS250 Subwoofer
- 104-Key Keyboard, Microphone & MS PS/2 Mouse
- Microsoft Windows 95 w/MS Plus, CyberSpace Pack
- Family/Office Multimedia CD Bundle (Preinstalled)
- Vertical Tower Case w/ 2 fans
- Limited 3-Year Warranty w/ In-Home Service

Business Lease $87

Max I5-P166MMX $2199
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- Intel 166 MHz Pentium® Processor w/MMX™
- 32MB EDO RAM w/512K Pipeline Burst Cache
- STB Velocity 3D Video Card w/4MB VRAM
- 3.2GB Hard Drive, 1.44MB 3.5" Floppy Drive
- 12x CD-ROM, Ensoniq Wavetable Sound Card
- 33.6Kbps Fax/Modem w/Voice Mail & Speakerphone
- 17" Princeton Graphics NI (16.1"VA) Monitor
- Altec Lansing ACS45 Speakers
- 104-Key Keyboard, Microphone & MS PS/2 Mouse
- Microsoft Windows 95 w/MS Plus, CyberSpace Pack
- Family/Office Multimedia CD Bundle (Preinstalled)
- Vertical Tower Case w/ 2 fans
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Business Lease $77

Max C7-PR200 $2299
Cyrix 6x86™ Processor — DO303

- Cyrix 6x86™ PR200 Processor
- 32MB EDO RAM w/256K Pipeline Burst Cache
- STB Velocity 3D Video Card w/8MB VRAM
- 4.0GB Hard Drive, 1.44MB 3.5" Floppy Drive
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- Family/Office Multimedia CD Bundle (Preinstalled)
- Vertical Tower Case w/ 2 fans
- Limited 3-Year Warranty w/ In-Home Service

Business Lease $80

Max C5-PR200 $1999
Cyrix 6x86™ Processor — DO306

- Cyrix 6x86™ PR200 Processor
- 32MB EDO RAM w/256K Pipeline Burst Cache
- Diamond Stealth 3D 2000 Video Card w/4MB
- 2.5GB Hard Drive, 1.44MB 3.5" Floppy Drive
- 12x CD-ROM, Ensoniq Wavetable Sound Card
- 33.6Kbps Fax/Modem w/Voice Mail & Speakerphone
- 17" Princeton Graphics NI (16.1"VA) Monitor
- Altec Lansing ACS45 Speakers
- 104-Key Keyboard, Microphone & MS PS/2 Mouse
- Microsoft Windows 95 w/MS Plus, CyberSpace Pack
- Family/Office Multimedia CD Bundle (Preinstalled)
- Vertical Tower Case w/ 2 fans
- Limited 3-Year Warranty w/ In-Home Service

Business Lease $70

Max A6-PR166 $1849
AMD K5™ Processor — DO323

- AMD K5™-PR166 Processor
- 32MB EDO RAM w/512K Pipeline Burst Cache
- Diamond Stealth 3D 2000 Video Card w/4MB
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- 12x CD-ROM, Ensoniq Wavetable Sound Card
- 33.6Kbps Fax/Modem w/Voice Mail & Speakerphone
- 17" Princeton Graphics NI (16.1"VA) Monitor
- Altec Lansing ACS45 Speakers
- 104-Key Keyboard, Microphone & MS PS/2 Mouse
- Microsoft Windows 95 w/MS Plus, CyberSpace Pack
- Family/Office Multimedia CD Bundle (Preinstalled)
- Vertical Tower Case w/ 2 fans
- Limited 3-Year Warranty w/ In-Home Service

Business Lease $66

The Multimedia CD Bundle

Corel WordPerfect Suite 7: *WordPerfect 7, Quattro Pro 7, Presentations 7, Sidekick 95, Envoy 7 CorelFLOW 3, Netscape by AT&T WorldNet, Dashboard 95, Corel Screen Saver, 150 fonts and 10,000 clip art images* **We also include:** Perfect Works, Perfect Works for Kids, Compton's Interactive Encyclopedia, Compton's Reference Collection, Windows 95 Primer, Internet Mania, Multimedia MBA, Resume Designer, Quicken Special Edition, Corel Print House, Compton's Ocean Explorers, Turn Around Turtle and Pandora's Box

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Circle 74 on reader service card

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Circle 191 on reader service card

Kensington Orbit: Contoured for Comfort

INPUT DEVICE

THINK OF TRACKBALLS and you probably think "clunky and funky-looking." But I was pleasantly surprised with Kensington Microware's new **Orbit.** Its contoured design addresses several ergonomic problems common to this kind of input device.

Typical trackballs are large and heavy; you often have to stretch and twist to reach the buttons arranged around the base. Kensington has tilted the Orbit's ball forward so your fingers curl over it. The ball on the preproduction unit I tried is a little smaller and lighter than most trackballs, so you don't have to work as hard to move it. The casing, shaped like a fat exclamation point, fits into the palm of your hand—further encouraging a relaxed, semiclosed position.

The Orbit's two wedge-shaped buttons sit below and on either side of the trackball, where your fingers fall naturally, so you don't have to stretch. The buttons are big enough to comfortably accommodate hands of all sizes.

I also liked the MouseWorks software that comes with the Orbit. The intuitive interface makes it easy to change trackball speed and customize buttons for specific applications.

Although version 5.02 of MouseWorks will ship with the Orbit, it wasn't ready for us to see; it promises even more features for making Windows 95 and Web surfing easier.

In fact, with all the functions possible in MouseWorks, I found myself wishing for a third button to make them easier to use. You can depress both buttons at once to get a third function, but I found this awkward. The key-button combinations for certain functions offered no improvement.

That complaint aside, I was pleased to see Kensington take a big step forward in making trackballs more comfortable. Now I'm waiting for the next big revolution: A trackball that tilts so I don't strain my wrist.

—*Melissa Riofrio* ▶

GETTING INTO ORBIT: Kensington's trackball offers convenience and comfort.

Orbit

PRO: Contoured design improves wrist and hand positioning.

CON: Lacks a third button.

VALUE: Innovative trackball design, extremely comfortable.

Kensington Microware Limited
800/535-4242, 415/572-2700
http://www.kensington.com
Street price: $60

READER SERVICE NO. 773

DeBabelizer Pro for PCs

GRAPHICS

ONE OF THE last popular Macintosh graphics software programs to migrate to the PC, Equilibrium's **DeBabelizer Pro** for Windows 95 and NT 4.0 is unfortunately overdue and expensive.

Along with a nifty name, the $399 DeBabelizer Pro has some handy tools, including a cool, proprietary SuperPalette application that optimizes colors and reduces processing time by creating a custom color palette.

But many other features touted by Equilibrium are hardly innovative. Scripting (similar to writing macros), batch processing, and the drag-and-drop interface are available in cheaper competing products, such as Ulead's $99 PhotoImpact.

The Mac version may be a classic, but DeBabelizer Pro is simply too little, too late, and too expensive.

—*Allyson Bates*

DeBabelizer Pro

PRO: Mac standby comes to the PC.

CON: Competition is cheaper, most features now standard.

VALUE: A year late and quite a few dollars short.

Equilibrium
800/824-8561
http://www.equilibrium.com
Street price: $399

READER SERVICE NO. 774

Circle 100 on reader service card

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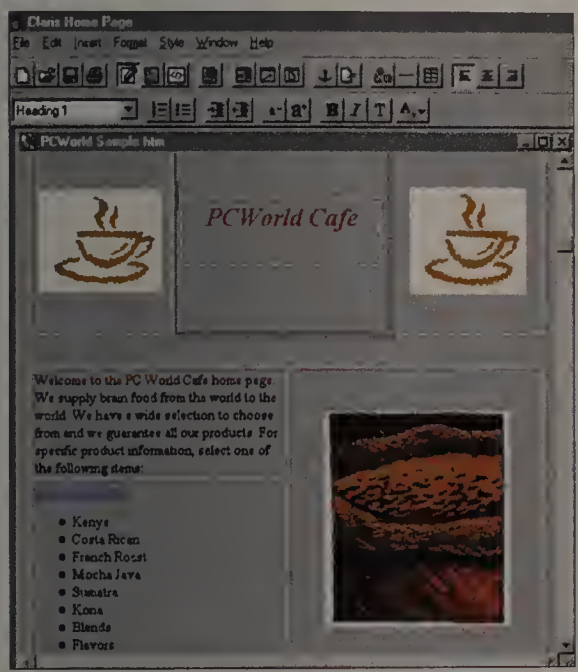
Home Page Update From Claris

WEB AUTHORING

TO JUMP-START its entry in the increasingly crowded WYSIWYG Web authoring tool market, Claris purchased San Andreas Systems—a developer with a product already in the works—and released version 1.0 of Home Page in August 1996. Less than a year later, here comes version 2.0.

This $100 package (free to registered users of version 1.0) addresses some of its predecessor's inadequacies. It has several page design templates, an improved tables editor for placing graphics more accurately, and a spelling checker. **Claris Home Page 2.0** also makes it easier to transfer pages and graphics to your corporate or ISP server, allows direct editing of HTML code, and displays statistics such as download times at various connect speeds.



NOT QUITE WYSIWYG: Web pages created with Claris Home Page 2.0 may look different online.

Unfortunately, Home Page has too many problems to earn a hearty endorsement. The barebones printed manual is woefully inadequate, the program's tutorial is only minimally helpful, and the on-screen help system is informative but not context-sensitive. Claris says it plans to publish a user guide at a price to be determined.

Home Page, like most of its competitors, is not truly WYSIWYG. To see how your documents will look online, you must view them in a Web browser. Also, line spacing in one page I created changed dramatically when I reopened it from within my browser.

The manual's installation instructions are completely wrong, and disk space miscalculations during the installation led to system lockups. I had to free up more than seven times the amount of space needed before the program installed smoothly.

Home Page's Macintosh roots show in the form of Mac-like quirks that may irritate PC users—most notably, tiny closing boxes for floating toolbars.

The Web authoring tool industry is in flux, and in some ways Home Page 2.0 reflects the enormous rush into this market. If you've got time to teach yourself how to use it, Home Page has enough strengths to stand as a reasonably priced product. If you're willing to spend $50 more, we recommend Microsoft's FrontPage 97. Otherwise, you might want to check out how Home Page stacks up against Adobe's $100 PageMill 2.0, another well-respected Macintosh product that's expected out soon for PCs.

—Jeff Sengstack ▶

Claris Home Page 2.0

PRO: Solid Web-page layout tool.

CON: Lousy documentation, WYS isn't always WYG.

VALUE: Fits the bill for the HTML-challenged on a budget.

Claris

408/987-7000

http://www.claris.com

Street price: $100 (free download to registered owners of Home Page 1.0)

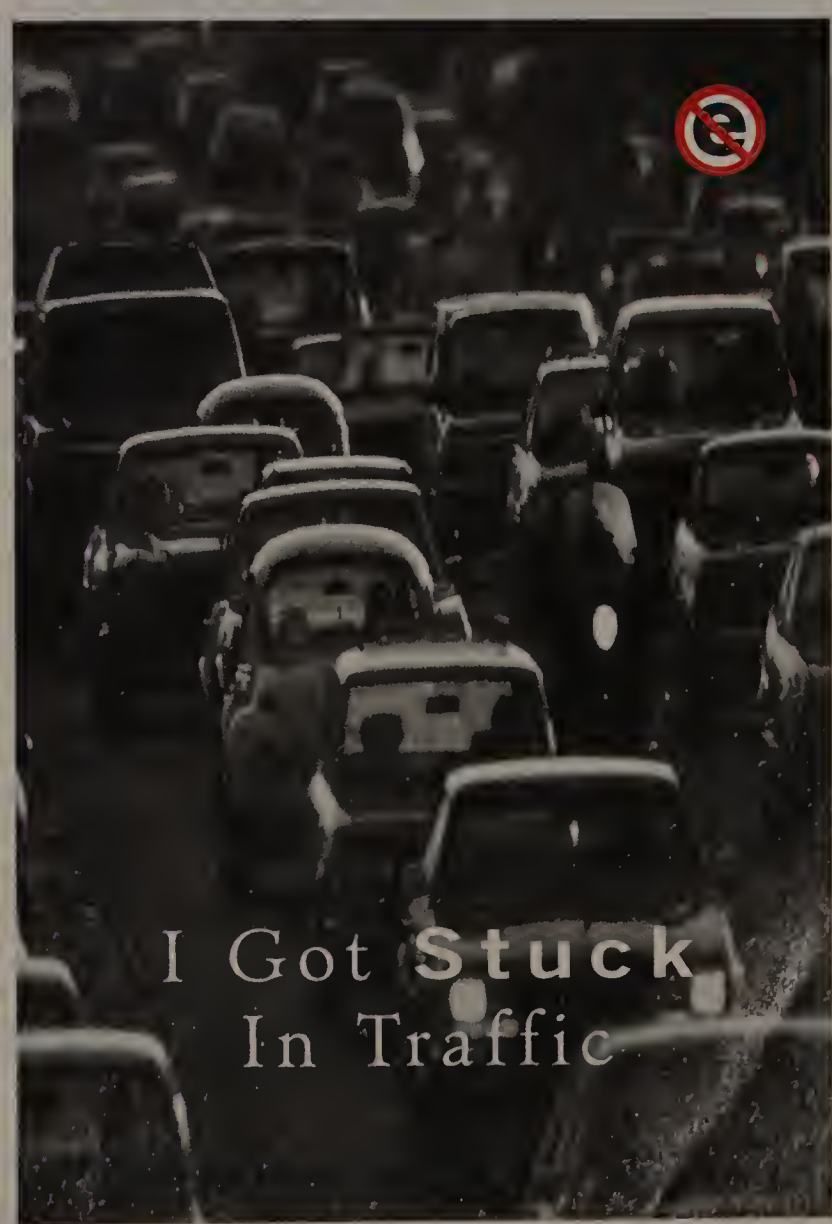
READER SERVICE NO. 776

QUICK TAKES

Gimmicky Keyboard

Hate clicking on icons or bookmarks? Darwin Keyboards' $60 Launchboard customizes any key to launch a program or take you to a Web site (<Ctrl>-<Alt> restores the original function). The software (sold separately for $30) works with standard keyboards. Unless you need a new keyboard, you may not want to pay the extra $30 for the boxed version, which includes a keyboard, 15 preprinted and 5 blank keys, a tool for popping out keys, and 12 preprinted and 8 blank labels. The preprinted keys are supposedly for top sites and programs—so what are E! and Family Planet doing there? Darwin Keyboards, 888/432-7946, http://www.darwinkeyboards.com.

READER SERVICE NO. 775



Circle 101 on reader service card

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www.provenedge.com

Circle 183 on reader service card

Replica Simplifies Server Recovery

B A C K U P

IF YOU'VE EVER suffered a network crash, you know how important a good backup and disaster-recovery system can be. With Stac Inc.'s **Replica**, recovering from a disk failure on your Novell NetWare or IntranetWare server is as simple as booting the system with Replica's Disaster Recovery disks and inserting your most recent full server backup tape.

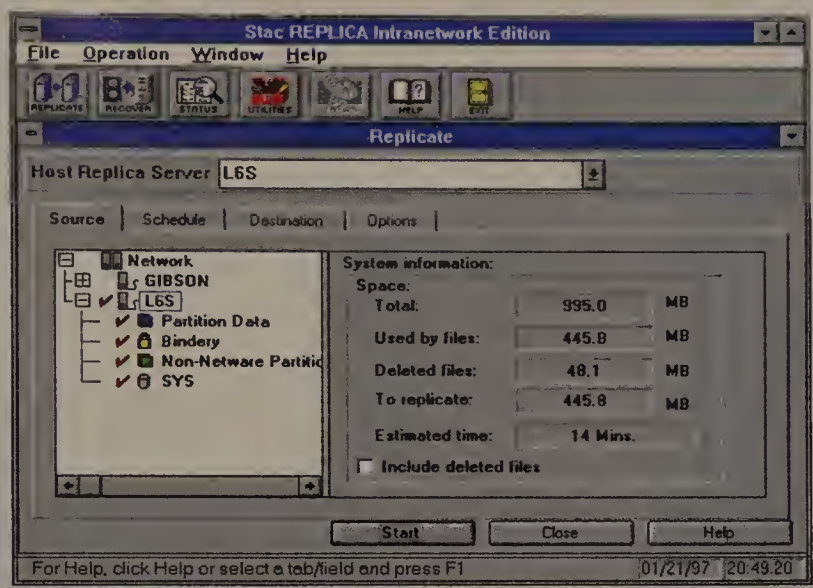
Replica's Intranetwork edition, which backs up multiple servers on a network from a single tape server, performed a full server backup on my network three times faster than my existing software. It then recreated my server— including DOS and NetWare partitions, operating system, and data—with no effort on my part beyond a couple of keystrokes initiating processes that previously required 2 hours of my time.

Replica does not permit incremental or differential backups, which record only files that have been modified since the last backup. Instead, it backs up entire servers, including open files, while users are logged on—there's no need to shut down the server. Restoration from a full backup takes longer, but is convenient for Web sites or other servers that must run uninterrupted.

Replica backs up whole volumes and servers, but files and directories can be restored individually thanks to the software's flexible approach. Backup tapes are mounted as read-only NetWare volumes, so that management utilities such as File Manager or Windows 95's Explorer can copy files and directories selectively.

Replica runs on Windows 3.1, Windows for Workgroups, and Windows 95, but requires recent versions of many NetWare files (available on Novell's Web site). Replica comes in three flavors: The Backup Edition, available for free from Stac's Web site, lacks the disaster recovery options; the $499 Single Server Edition is competitive with rival products for small networks; and the $899 Intranetwork Edition is an excellent deal.

—*David Schamus*



PREVENTING DISASTERS: Stac's Replica displays all objects on a server as they are being recreated during restoration.

For more information about a product, contact the manufacturer or circle the number on the reader service card. ■

Replica

PRO: Easy disaster recovery, backups don't require server shutdown.

CON: Slow restoration.

VALUE: Time-saving disaster recovery for NetWare, plus free PC backup software.

Stac Inc.

800/279-7822

http://www.stac.com/

List price: Intranetwork Edition $899, Single Server Edition $499, Backup Edition free.

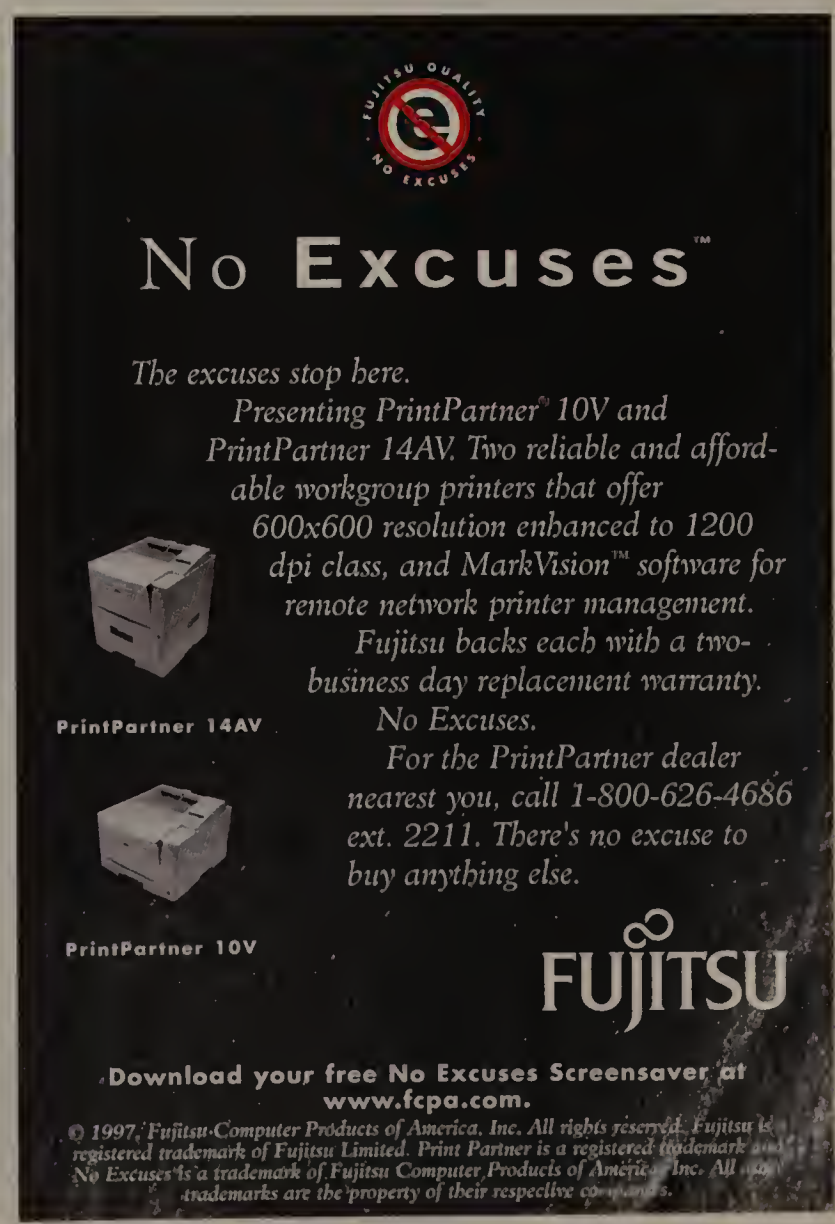
READER SERVICE NO. 778

QUICK TAKES

Web Scheduler

Campbell Services' OnTime Enterprise 4.0 brings to Windows NT the multiplatform group scheduling features previously offered in OnTime's popular Novell and Banyan Vines services. Ontime Enterprise allows network users on any operating system to schedule appointments or meetings using Windows and Macintosh clients, or—for a small additional charge—via any Web browser. An optional add-in allows use with Lotus Notes. Other features include a Web Calendar Publisher, embedded URL support, and support for SMTP e-mail notification. Prices range from $40 to $56 per user. Campbell Services, 800/559-5955, http://www.ontime.com

READER SERVICE NO. 777



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Cache External	256KB Write Back	256KB Write Back	512KB Write Back
Video Memory/Max.	1MB/2MB EDO	2MB/2MB EDO	2MB/8MB WRAM
Video Graphics	Cirrus 5446 PCI	Cirrus 5446 PCI	Matrox MGA Millennium
Diskette Drive	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB
Expansion Slots/Drive Bays	5/5 Desktop	5/4 Desktop	7/5 Minitower
Ports: Serial/Parallel	1/1 (ECP)	1/1 (ECP)	1/1 (ECP)
Intelligent Manageability	Yes	Yes	Yes
CD-ROM	Optional	Optional	Standard (PDCD)
Software Pre-installed	Windows® 95 or Windows 3.1	Windows 95 or Windows 3.1	Windows NT Workstation 4.0
Limited Warranty†	3-Year	3-Year	3-Year
Price* (monitor not included)	**$1,199**	**$1,599**	**CALL**

intel inside pentium® PROCESSOR

*All prices shown are Compaq DirectPlus prices and do not include monitors. Reseller prices may vary. Other models available. Monitors and certain options are covered by a One Year Limited Warranty. †Compaq Deskpros are covered by a Three-Year Limited Warranty. Restrictions and exclusions apply. Offer available in the U.S. only. © 1997 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo registered U.S. Patent and Trademark Office. Products, prices, and programs are subject to change without notice. Windows and Windows NT are registered trademarks of Microsoft Corporation. Deskpro is a registered trademark and DirectPlus is a registered service mark. The Intel Inside Logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. Other products are trademarks of their respective companies.

Circle 47 on reader service card

Best WAYS to *browse* the WEB

A great browser isn't enough. Rev up the Internet with these add-ons, plug-ins, and extras.

BY PETER SCISCO

What's Inside

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115 Virus Protection File Encoding/ Decoding/Compression

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118 Grab Bag

"My browser has more bookmarks than Barnes and Noble. I'm connected to so many newsgroups people think I'm Rupert Murdoch. I've got more plug-ins than Circuit City. So how come I still can't find what I want, protect my children, or send secure messages on the Net?"

How come? Because you don't have the right tools. Some of the programs described here will save you time, some will save you money, some may even save your PC. You can also download many of them from *PC World*'s World Wide Web site at http://www.pcworld.com/software_lib. Any of them will make your Internet experience more productive, and even a little more fun. ▶

ILLUSTRATIONS BY STEVEN LYONS

Offline Readers and Browsers

WE'VE ALL SEEN OUR FAVORITE WEB SITE disappear behind a "server is busy" message—the Internet equivalent of "Wide Load Ahead." To get the most online, get offline. Invest in software that will download Web sites and messages for your offline perusal and then hang up.

I use WebEx for off-line browsing, despite its confusing interface. For managing newsgroups—and for avoiding the truly stupid ones—I'll sign up Free Agent any day. For the latest personal newspaper, it's hard to beat PointCast Network, although you'd better check with the MIS folks to see if they mind an outside source pushing its content down your company's pipeline.

FREE AGENT 1.1 Try talking your way through thousands of newsgroups with names like alt.sponge.bath.soup, and a vow of silence starts to sound pretty good. That's why I rely on this easy-to-use newsgroup manager. I can retrieve headers or entire messages, mark threads or single messages, post quick replies, and e-mail private responses using easily understood buttons. *Forte, free, 619/431-6497 (fax), http://www.forteinc.com.*

POINTCAST NETWORK It's one thing to discuss guitars in a newsgroup—it's quite another to get late-breaking news. PointCast has cut my CNN time down to 30 minutes a day. This

Plunging Into Plug-Ins

THINK HOW DREARY the Web would be if you couldn't watch the video of the Loch Ness monster or parade around as a giant porcupine in 3-D chat rooms. But Navigator and Internet Explorer need plug-ins to give them these jazzy multimedia capabilities.

Many plug-ins come as downloadable shareware or freeware. Unlike helper apps—independent programs your browser can launch—plug-ins load and act as if they're part of your browser.

Most plug-ins are written for Navigator, and the best place for the latest list is Netscape's plug-in page (http://home.netscape.com/comprod/mirror/navcomponents_download.html). Most Navigator plug-ins also work with Internet Explorer 3.0.

Internet Explorer has its own breed of plug-ins, called ActiveX controls. You can learn about the latest ActiveX goodies at Microsoft's Web site (http://www.microsoft.com/activex/gallery).

For Explorer users, the real advantage of ActiveX plug-ins is that they download and install automatically when you access a site that uses them; Navigator plug-ins must be installed with all the hassles of conventional applications.

Navigator supports ActiveX—at least it does once you've installed NCompass, a plug-in from NCompass Labs (http://www.ncompasslabs.com).

Africa grows out of the globe in Nissan's online safari—a special effect courtesy of Macromedia's **SHOCKWAVE** plug-in.

Here are the indispensable plug-ins for every Netizen:

ACROBAT READER This free plug-in lets you view and print documents in Adobe's Portable Document Format, which can be read by almost any computer. Download the Reader from Adobe's site (http://www .adobe.com/).

LIVE3-D Fly through 3-D virtual reality spaces with Netscape's free Virtual Reality Modeling Language (VRML) viewer. Download it from the Netscape site (http://home.netscape.com/).

QUICKTIME Enjoy QuickTime animation and MIDI music as it downloads. This is free from Apple (http://www.quicktime.apple.com/sw/).

REALAUDIO PLAYER Progressive Networks' RealAudio Player lets you listen in real time as the signal comes through your modem. The basic version is free, while the enhanced RealAudio Player Plus costs $29.99 list; both are available at the RealAudio site (http://www.realaudio.com).

SHOCKWAVE If you plan to play Web-based games, listen to live concerts, or watch animated football plays, you'll need to download Macromedia's free plug-in first from the company's Web site (http://www.macromedia.com/shockwave/download/).

—Judy Heim

personal newscast draws stories from reputable wire services like Reuters and news outlets like *The New York Times*, as well as press releases from PR distributors like Business Wire. I'm hooked. *PointCast, free, http://www.pointcast.com*

WEBEX Busy signals? Server not connected? Please wait. No, I'll send WebEx to download the newest revisions to my favorite Web sites while I sleep, and check the results over coffee in the morning. If I need more details about a particular link, I just mark it for later retrieval. WebEx does suffer from a poor user interface, however. *Traveling Software, $29.95 list, 800/343-8080, http://www.travsoft.com* READER SERVICE NO. 695

E-Mail Clients

WEB SITES ARE THE CHROME of the internet, but e-mail is the fuel. Netscape Navigator and Microsoft Internet Explorer can sort of do the job, but you can forget about advanced features. If you live and die by your e-mail, Eudora Pro comes to your door signed, sealed, and delivered as the best. E-mail Connection helps you juggle online service and intercompany mail as well as Internet traffic. And if you're stuck with Windows 95's bundled Microsoft Exchange, at least upgrade it to Windows Messaging.

EMAIL CONNECTION Need accounts on more than one online service—for example, so you can share files easily? EMail Connection is your electronic lifeline. It can manage scheduled mail pickups and deliveries, handle all of your screen names and passwords, and let you set rules for filing mail. I just wish there was a 32-bit version that could use the Windows 95 Dial Up Connection. *ConnectSoft, $49.95 list, 800/889-3499, http://www.connectsoft.com* READER SERVICE NO. 696

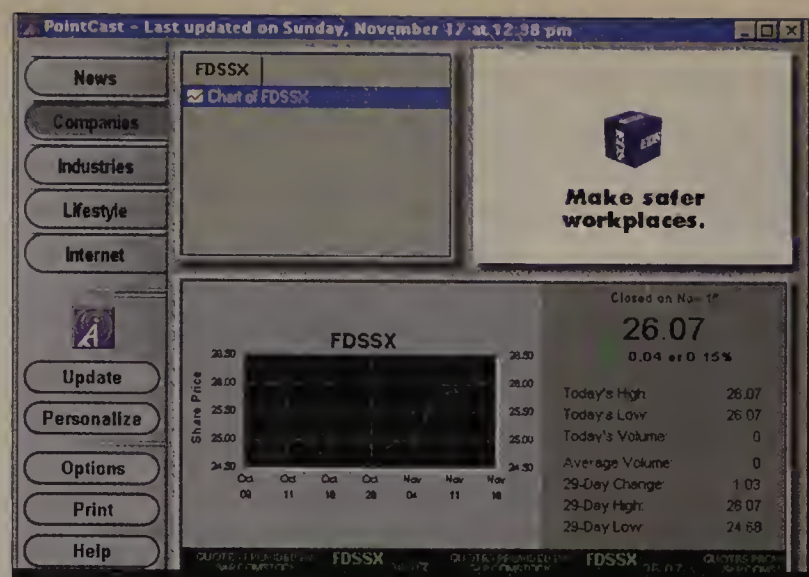
EUDORA PRO 3.0 If your e-mail in-box looks like the Post Office on the day before taxes are due, you need the full slate of tools in this venerable package. The free "light" version doesn't offer much more than your browser's built-in mail drop, but Eudora Pro gives you a spelling checker, rules for automatically routing mail, and flags for marking messages by priority or other criteria. *Qualcomm, $89 list, 800/238-3672, http://www.eudora.com* READER SERVICE NO. 697

WINDOWS MESSAGING If you must use Windows 95's bundled Microsoft Exchange as your e-mail client, update to this upgrade with a new name. It loads faster, nearly quadruples file-sending speeds on 8MB machines, and cuts a lot of the glitches from fax and Internet mail handling. *Microsoft, free, http://www.microsoft.com/windows/software/exupd.htm*

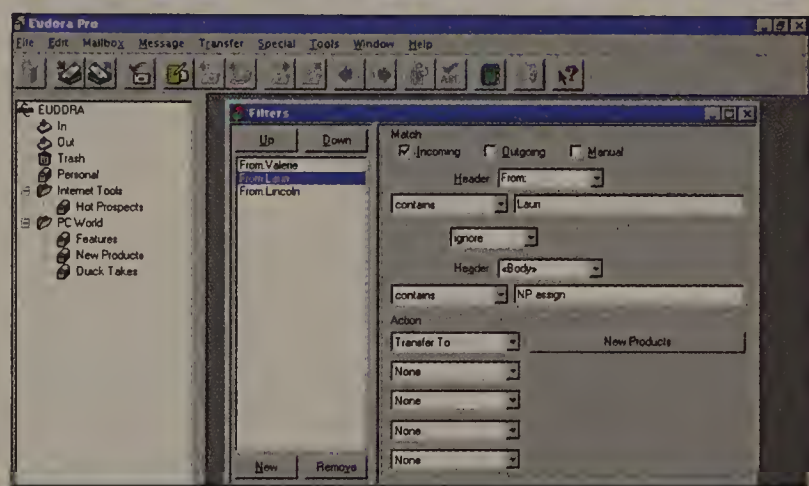
FREE WARE

Bookmark Tools

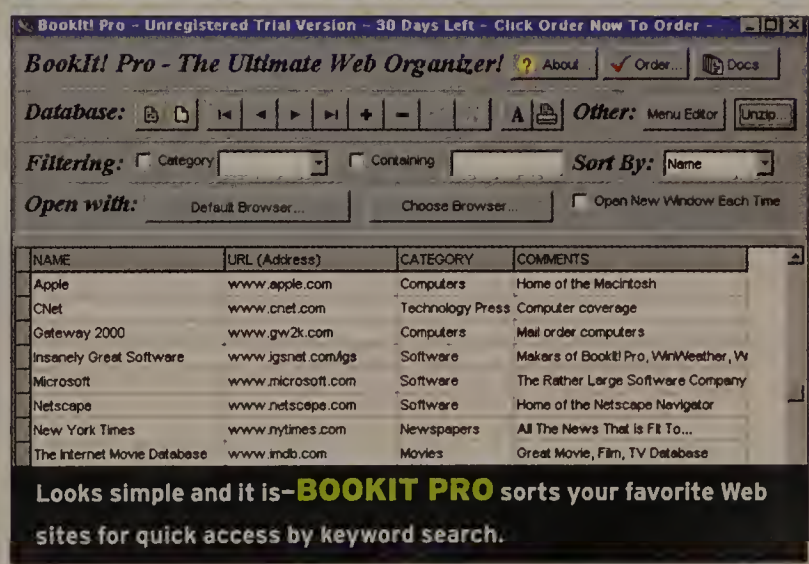
BOOKMARKS ARE FINE in books, but if you were to put one at every page you found interesting, you might as well toss the book and wait for the movie. On the Web, you may need to mark your trail with something a little more sophisticated than your browser's bookmark feature (called *favorites* in Internet Explorer).



Keep up with stocks, follow the news, and watch commercials on **POINTCAST** newscasts.



Queen of the mailbox managers, the Pro version of Qualcomm's **EUDORA** will keep you from going postal.



Looks simple and it is—**BOOKIT PRO** sorts your favorite Web sites for quick access by keyword search.

Powermarks gets my bid as the desktop Lewis and Clark. It's more efficient and $10 cheaper than BookIt Pro, which gets an honorable mention for its sorting and management power.

BOOKIT PRO Bookmarks don't have to be pretty, just useful. This no-nonsense program organizes URLs in a table similar to a spreadsheet. It's not particularly easy to use—you have to cut and paste URLs into the database. But once they're there you can sort and categorize to your heart's content. You can put Web links in the Taskbar's tray—that row of tiny icons on the right end of the Taskbar—for easy access. *Insanely Great Software, $24.95 registration, 800/319-5107, http://www.igsnet.com* READER SERVICE NO. 698 ▶

SHARE WARE

POWERMARKS 1.02 Powermarks makes it easy to save bookmarks and favorites for sites you want to return to. While visiting a site, just click the Quick Add button to save the URL to your personal list. Powermarks will add a descriptive title and some keywords. You can sort by name or URL with a single click, or pare your list by typing a keyword into a search box. The program imports favorites and bookmarks. *Bitlogic, $14.95 registration, 800/699-6395, http://www.bitlogic.com/pm* READER SERVICE NO. 699

Search Tools

ONLINE SEARCH ENGINES like AltaVista are hit-and-miss, and using a whole bunch of them at once is like juggling balls, pins, and torches. A local search tool on your computer should be able to act as an expert juggler, using several search engines and directories at once, remembering each one's syntax, sorting the results, and culling duplicates. Internet FastFind leads the pack because it's easy to use and has a splendid array of extra tools. WebCompass is more configurable, but ugly. WebFerret is much simpler and is nicely integrated with Windows 95.

INTERNET FASTFIND This excellent package offers so much—an interface that's as easy to use as your browser, FTP, on-the-fly zip and unzip, a patch monitor to send you to a vendor's site for the latest hardware and software drivers—that I nearly forget what an excellent search tool it is. I can set up searches for a given number of hits across several directories and search engines, and then put whatever bookmarks I create on the Taskbar's tray. One warning: Internet FastFind's exceptionally rude installation program changes many of your Windows configurations without even asking your permission first. *Symantec, $50 street,800/441-7234, http://www.symantec.com* READER SERVICE NO. 700

WEBCOMPASS 2.0 The problem with most Internet search engines is that you get too many hits. WebCompass 2.0 filters out duplicate information sources and kills dead links to make your information searches more productive. You can add your own search engines to its list of seekers for more focused searches. *Quarterdeck, $50 street, 800/354-3222, http://www.quarterdeck.com* READER SERVICE NO. 701

WEBFERRET This package adds itself to the Start•Find menu, so you can look for Web sites the way you search for files. WebFerret will run searches through AltaVista, Ananzi, Infoseek, Lycos, and Yahoo. The hits are displayed in a small screen alongside advertising; you can view relevancy ratings and an abstract by passing your cursor over the listed item. *FerretSoft, free, http://www.ferretsoft.com*

File Viewers

A GOOD FILE VIEWER is worth every penny on the Internet, so you can see the contents of any kind of file you might download or get via e-mail. Nothing beats Quick View Plus for viewing all sorts of files, but LView Pro is fine for viewing graphics.

LVIEW PRO If you deal mostly with graphics, this viewer does the job quickly for about half the price of Quick View Plus. It displays common formats like JPEG, GIF, TIF, TGA, BMP, and PCX, and will view and decode UUEncoded file attachments. LView Pro also supports scanners, a slide-show maker, and graphic editing tools for changing everything from color balance to size. *MMedia Research, $30 registration, 954/458-9698 (fax), http://www.lview.com* READER SERVICE NO. 702

Unplugging Plug-Ins

A BROWSER PLUG-IN is like that tape recorder you plug in to your car's cigarette lighter. Occasionally useful, it spends most of its time in the passenger seat—tripping the seat-belt light, slipping to the floor, and generally annoying you and your passengers.

But removing a plug-in isn't as easy as cleaning out your car. Plug-ins tend to leave behind their personal effects. They should be able to uninstall themselves. If they can't, Navigator and Internet Explorer should be able to find and destroy them. Since they don't, here are strategies for evicting unwanted plug-ins.

Know what you have. In Navigator, select *Help• About Plug-Ins* for the facts on your installed plug-ins. Internet Explorer doesn't offer anything this handy, but all of your ActiveX programs should be in a folder that's probably called 'c:\Program Files\Plus!\Microsoft Internet\Plugins' or 'c:\Program Files\Microsoft Internet\Plugins'. ActiveX plug-in file names end in an .ocx extension, but not all .ocx files are plug-ins.

Try the safe approach. Some plug-ins have uninstall routines. In the Control Panel, double-click *Add/Remove Programs.* If your plug-in's on the resulting list, then all's clear.

Delete and pray. You can always drag and drop plug-ins from their folder into the recycling bin, but that won't remove all their litter, which may cause problems with future plug-ins that view or play the same types of files. What's more, your browser may look for the plug-in and refuse to load without it. So move the plug-in to another folder and try using your browser before actually making the deletion.

Try an uninstaller. Windows 95 clean-up programs like

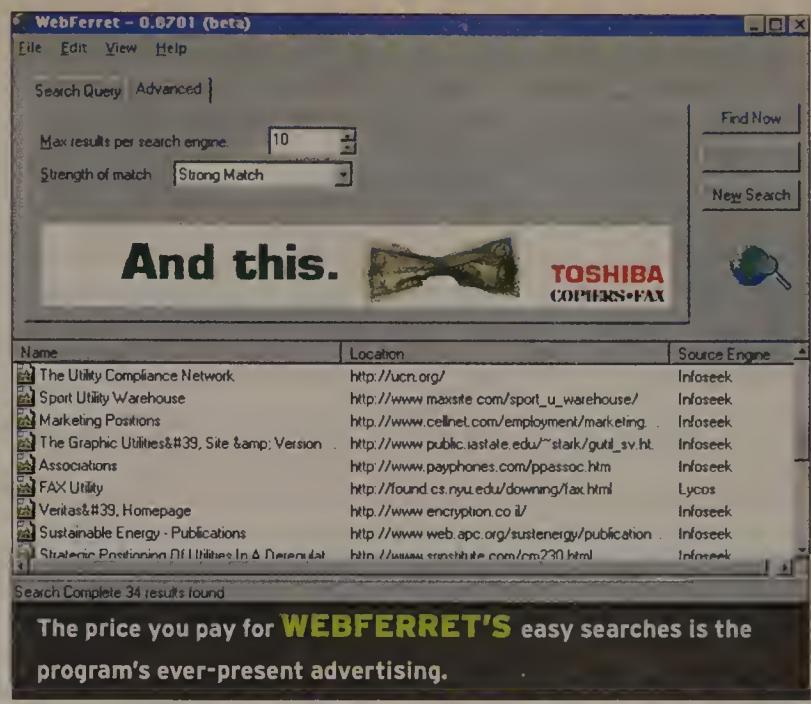
QUICK VIEW PLUS 4.0 True story: Two hours before filing this article, my Word document became corrupted during one of those cosmic computer glitches caused by deadlines. But I was able to open the file in Quick View Plus, then copy and save my work under a new name. You can do the same thing with 200 file types. Aside from a virus scanner, this is the most useful Internet tool you can own. *Inso, $59 list, 800/333-1395, http://www.inso.com* READER SERVICE NO. 703

Virus Protection

IF YOU CONNECT, YOU'VE GOT TO PROTECT. Viruses don't just slip into your PC wearing cool shareware clothing—they can infect documents and e-mail attachments, too. PC-cillin II gives you the best antiviral shot for the money. It's more comprehensive than McAfee's WebScan, although WebScan packs extra tools for Internet users. SurfinShield 2.0 does a great job of guarding against suspicious Java applets.

PC-CILLIN II The easiest virus checker to use is also the fastest and most comprehensive. PC-cillin II scans e-mail and file downloads, supports drag-and-drop scanning for files and folders, and even adjusts itself to the way you use your PC. To keep up with the latest viruses—including insidious macro viruses—just press a button to log on to the Touchstone Web site. *Touchstone Software, $49.95 list, 800/531-0450, http://www.checkit.com* READER SERVICE NO. 704

SURFINSHIELD 2.0 You can't visit a Web site these days without some Java applet sending a ticker display across the bottom of your screen. But just in case that bit of fancy programming hides something meaner than a depressing stock quote, this Java watcher monitors such applets, shutting suspicious ones down. Until virus checking software gets smart about distributed applets, SurfinShield remains on guard. *Finjan Software, $49 registration, 888/346-5268, http://www.finjan.com* READER SERVICE NO. 705



The price you pay for **WEBFERRET'S** easy searches is the program's ever-present advertising.

A taste of JAVA is great as long as you don't find anything at the bottom of the cup. **SURFINSHIELD** keeps you safe.

WEBSCAN If any of more than 8000 known viruses tries to sneak into your PC through a download or as an e-mail attachment, WebScan will stop it cold. McAfee's program works with your browser and bundles several extras, including Pegasus Mail (a decent e-mail client), PointCast, and CyberSitter (a parental control program). *McAfee, $40 list, 408/988-3832, http://www.mcafee.com.at* READER SERVICE NO. 706

File Encoding/Decoding/Compression

BINARY FILES SENT ACROSS THE NET tend to land in the dead letter office. The two major encoding schemes for sending files via text-only Internet e-mail—UUEncode and MIME—aren't compatible, and there are incompatible variations on MIME. So you want a program that will decode downloaded files, prepare files for transmission, and even zip and unzip files. You can hide the mysteries of file encoding with either XferPro or Decode Shell Extension. And nothing makes compression easier than ZipFolders. But for the best of both worlds, get WinZip 6.2, which builds encoding and compression into one complete package.

DECODE SHELL EXTENSION Windows 95 users can add encoding/decoding functions directly to the Explorer menu with this handy utility. Just right-click a file and you get an option to encode it. Right-click ▶

MicroHelp's UnInstaller and Quarterdeck's CleanSweep can help you remove some of that leftover garbage. They can sift through Windows' registry and .ini files looking for unnecessary entries, identify orphan files, and find redundant .dll files. They can also store suspected garbage in compressed files, giving you a chance to see if your system will fall apart without those files. The problem with these programs, though, is that you have to be fairly sophisticated to use them effectively and safely; it's too easy to delete important configuration files.

Take drastic action. While installing a second hard drive, my spouse wiped out everything on the first drive, forcing me to reinstall all of my applications from scratch. This did get rid of all those plug-ins.

—*J. H.*

CleanSweep $40 street; Quarterdeck; 800/354-3222, http://www.quarterdeck.com
READER SERVICE NO. 719

UnInstaller $39.95 list; MicroHelp; 800/922-3383, http://www.microhelp.com
READER SERVICE NO. 720

an encoded file, and you can decode it. It doesn't get much easier than that, now does it? *Funduc Software, free, http://home.sprynet.com/sprynet/funduc*

WINZIP 6.2 The veteran compression program is now attracting its share of Netizens, thanks to UUEncode, MIME, BinHex, and Xxencoded encoding and decoding capabilities. You can install programs directly from an archive—a great help for checking out promising shareware. And a new wizard makes it all easy. *Nico Mak Computing, $29 registration, 800/242-4775, http://www.winzip.com* READER SERVICE NO.755

XFERPRO 1.1 This drag-and-drop tool, which works just fine in Windows 3.x, can encode any file for Internet delivery and decode what you receive. The program automatically checks file formats and uses the appropriate and compatible UUEncode, BinHex, MIME, or other method necessary to handle the job. *Sabasoft, $17.95 registration, http://www.sabasoft.com* READER SERVICE NO. 707

ZIPFOLDERS 2.01 I work with a lot of zipped files, but I hate fussing with them. ZipFolders eliminates most of the fuss. It lets my usual viewers and editors work with my zipped files, without making me decompress them. It also supports password encryption and translates other compression formats into the .zip format. *Mijenix, $29.95 list, 800/645-3649, http://www.mijenix.com* READER SERVICE NO. 708

Encryption

THE NEED FOR INTERNET SECURITY isn't just the paranoid delusion of some miscreant loner living in a cabin in Idaho. To safeguard the files and messages you send over the Internet, the secret is WebCrypto, which goes far beyond the quick e-mail security you get from the cheaper Crypt-o-Text.

CRYPT-O-TEXT Just type your message, copy it to the Crypt-o-Text window, encrypt it, then copy and paste it into your e-mail client. The recipient will need Crypt-o-Text to read it, and Crypt-o-Text cannot encrypt file attachments. *Savard Software, $15 registration, http://www.owt.com/users/rsavard/software.html* READER SERVICE NO. 709

WEBCRYPTO When you password-protect an e-mail message or file attachment with WebCrypto, that mail will arrive in a self-extracting file that can hold up to 1000 documents. The recipient doesn't need WebCrypto, and it's as easy to use as a compression program. *McAfee Associates, $40 street, 408/988-3832, http://www.mcafee.com* READER SERVICE NO. 710

Child Protection

IT'S FOUR IN THE AFTERNOON—do you know where your kids are? If you're worried that they might be surfing http://www.naked_senators.com, pick up a program such as Cyber Patrol, which acts as a chaperone

Tips for Better Browsing

UTILITIES CAN GO a long way to improve your Web experience, but why not make the best use of what's already in your browser? Here are tricks to get the most from version 3.0 of either Netscape Navigator or Microsoft Internet Explorer.

USE THE RIGHT MOUSE BUTTON

It's amazing what you can do in either of these programs by right-clicking. For instance, in Navigator, when you right-click any place on a page that isn't a link, you get options to add a bookmark, to jump forward (if, of course, there's a page to jump to) or back to the last page you visited, or to create a Windows 95 Shortcut. In Explorer, right-clicking within a page gives you several options, such as selecting all of the page's text so as to copy it to the clipboard, creating a Windows 95 Shortcut, adding that page to your favorites folder, and even viewing the page's HTML source code.

In either program, by right-clicking a link you can open that link in a new window, copy the URL to the clipboard, save the target page to your local drive, and create a bookmark in Navigator (a favorite in Internet Explorer) or even a desktop Shortcut to the target.

Internet Explorer has another trick up its sleeve: For more viewing room, right-click the title bar and uncheck *Toolbar* and/or *Status Bar*.

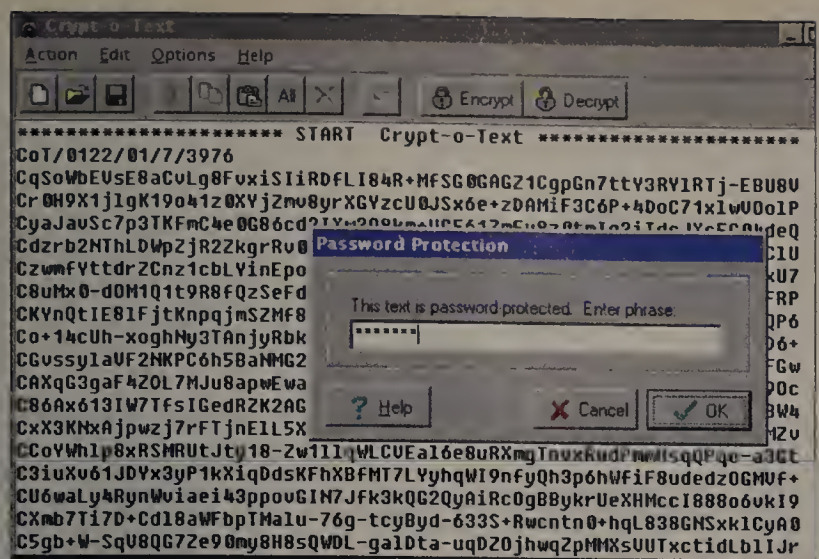
DON'T USE THE MOUSE

The keyboard is mightier than the mouse—at least it's usually faster. When you can, keep your hands there.

When it's time to type in a URL, don't mouse to the address field. In Navigator, press <Ctrl>-L, and in Internet Explorer <Ctrl>-O. This step will bring up a dialog box in which you can enter the address.

And you don't have to type all that 'http://www' stuff, either. Both Navigator and Explorer are smart enough to figure that out on their own. Try it with pcworld.com. In fact, with Navigator, you don't even have to type the '.com'—pcworld will do. If you're trying to get to something.org or thatotherthing.edu, you'll have to include the suffix.

And there's more: In either program, you can move forward and backward between pages you've just visited with <Alt>-<Right Arrow> and <Alt>-<Left Arrow>. Want a history of where you've been lately? Press <Ctrl>-H for a listing. While you're waiting for a page to load, type <Ctrl>-N to open an additional program window

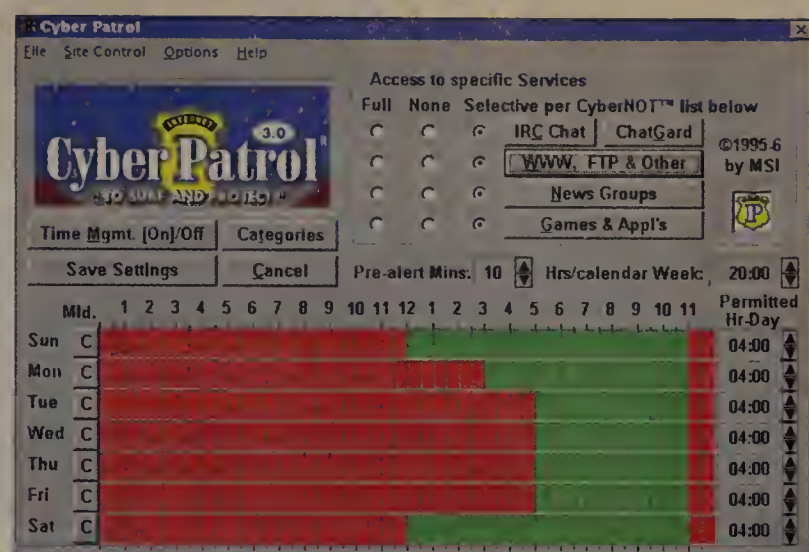


If you can read this then you're either too close or you have **CRYPT-O-TEXT** installed on your PC.

within Navigator or Internet Explorer. Providing more control, InterGO also serves as its own browser.

CYBER PATROL This watchdog lets you limit access to all levels of Internet services, including chat, FTP, Web, and Usenet groups. Cyber Patrol can be used with any browser, Internet service provider, or commercial online service. It uses the SafeSurf and RSAC ratings, as well as its own rating, so you don't have to enter every instance of objectionable material. *Microsystems Software, $29.95 list, 800/828-2608, http://www.microsys.com/cyber* READER SERVICE NO. 711

INTERGO This child-friendly browser lets you control Web site visits (setting sliding scales for questionable subjects from



Monitor the time that your kids (or your employees) spend cruising the Internet with **CYBER PATROL**.

bigotry to pornography) and access to e-mail, newsgroups, and chat. *InterGO Communications, $49.95 list, 972/424-7882, http://www.intergo.com* READER SERVICE NO. 712

Collaboration

INTERNET PHONE APPLICATIONS steal the headlines, but for most of us the telephone is easier to use, more convenient, and sounds better. Remote collaboration on documents and presentations is another matter. Whiteboard software like NetMeeting and Internet Conference Professional can save you small fortunes on fax and courier services, but their true value comes from sharing documents over great distances. Internet Conference runs faster, but NetMeeting is free and lets you share applications. ▶

where you can head to another site. And when you want to find a specific word on the current page, don't waste time hunting around. A quick <Ctrl>-F brings up a handy Find tool.

OTHER TRICKS

Pick a Home Page. That's the page your browser automatically goes to when you launch it, or when you click the icon that looks like a house. To change it in Navigator, select *Options•General Preferences* and click the *Appearance* tab. Then in the 'Browser Starts With' field, type your favorite URL. In Explorer, select *View•Options*, and click the *Navigation* tab. Then, in the Page Field, select *Start Page*, and type the URL into the Address field.

Enlarge the font. Ever land on a page with tiny type? In Navigator, Select *Options•General Preferences* and click the *Fonts* tab. Click one of the *Choose Font* buttons depending on which standard font you wish to change. It's easier in Internet Explorer: Click on the Toolbar's *Font* button (it has the letter "A"). Each click bumps the font up to the next larger size, then back to the smallest when it can't get any bigger.

Print selectively. Say you want to print part of a long Web page, more than will fit on one sheet. The standard print dialog box lets you set a range of pages, but how do you figure out which to print? In Navigator, select *File•Print Preview*. Click *Next Page* until you get the pages you want. Then press *Print* and set your range in the resulting dialog box. You can't do this in Internet Explorer.

Head off headers while printing. There's also an easy way to get rid of those pesky URL and document titles. In Navigator, select *File•Page Setup* and remove the check marks from the items you don't want to print. It's just as easy in Internet Explorer: Select *File•Page Setup*, click *Headers/Footers*, and delete the weird codes in all or some of the fields.

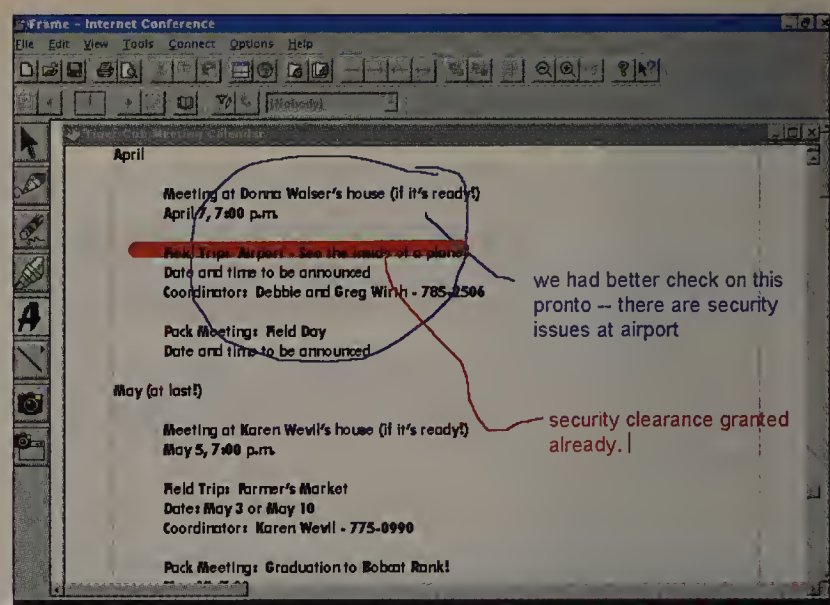
—*Steve Bass*

Right-click anywhere in either **NAVIGATOR** (shown here) or Internet Explorer for a selection of options.

INTERNET CONFERENCE PROFESSIONAL 2.0 This is just the ticket for getting quick revisions and feedback from as many as 255 colleagues. It's a little tricky to learn but pretty easy to use. Add a full-duplex audio card and you can converse while you revise (or doodle on) the spreadsheet that someone from accounting insists should be the centerpiece of your marketing proposal. *VocalTec, $149.95 list, 201/768-9400, http://www.vocaltec.com*

READER SERVICE NO. 713

NETMEETING 2.0 With its wizards, use of colors to distinguish marks from different users, and lowest-possible price, NetMeeting 2.0 is an easy choice for workgroups. A smart installer does everything from testing your audio card to creating a directory listing for all users. You can chat on the phone as you examine a work-in-progress together, and share applications with coworkers who don't have the programs installed. *Microsoft, free, http://www.microsoft.com/netmeeting*



Mark the spot on company documents when you collaborate with **INTERNET CONFERENCE PROFESSIONAL.**

Grab Bag

IT'S PROBABLY FOR THE BEST, but not everything can be classified. Here are a few of my favorite Internet tools that wouldn't fit into a category, no matter how hard I tried. But don't think these programs are any less valuable just because they aren't easily pigeonholed.

AUTOSPELL 4.1 Don't make yourself look bad by sending error-filled e-mail messages. Add a spelling checker to Netscape Mail, America Online, CompuServe, or any other e-mail program or editor without its own spelling checker. If you use Microsoft Office applications, AutoSpell uses your custom dictionaries. *CompuBridge, $19.95 registration, 888/773-5525, http://www.spellchecker.com*

READER SERVICE NO. 714

Inter-Not!

MANY AN Internet tool belongs not on your desktop but under your desk, in the round file. Here are three to avoid.

EARTHTIME 2.0 I don't really care when the sun comes up on Guam. And I don't mind if my PC's clock is a few minutes off—you should see the clocks in the rest of my house. *Starfish Software, $19.95 list, 888/782-7347, http://www.starfishsoftware.com*

READER SERVICE NO.721

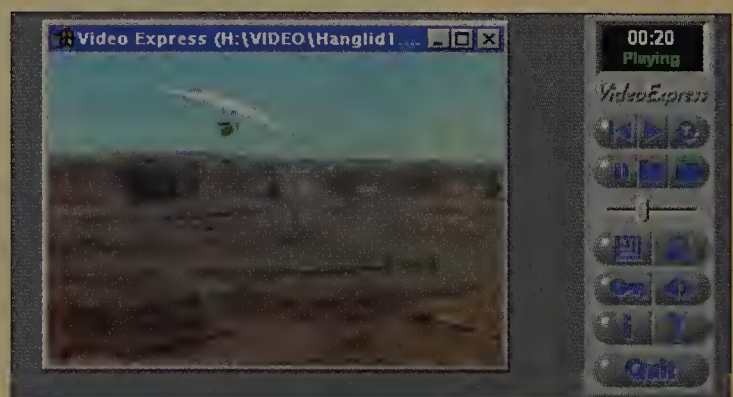
NET NANNY You don't want the kids to joyride, but this is like pouring a pound of sugar in your gas tank. I hate the DOS monitoring sessions, the crummy installation, and having to type in all the dirty ideas I don't want my kids to see. *Net Nanny International Software, $39.95 list, 800/340-7177, http://www.netnanny.com/netnanny*

READER SERVICE NO.722

VIDEO EXPRESS VIEWER This is really just a fancier face for the Windows Media Player. True, it adds support for ActiveX, ASF, and MJPEG, but you can get free players or plug-ins for those. And the program does nothing with VDO and other streaming video formats. *ImageMind, $39.95 list, 800/321-5933, http://www.imagemind.com*

READER SERVICE NO.723

—*P. S.*



Why bother? **VIDEO EXPRESS VIEWER** is just a souped-up interface for the Windows Media Player.

DUNCE 2.4 You'd think that the Windows 95 Dial-Up Connection would be smart enough to actually dial up without your having to click that silly Connect button. Well, DUNCE (Dial-Up Network Connection Enhancer) is that smart. Better yet, it will keep dialing when your ISP won't pick up or when the line is busy, and even let you schedule off-hours connections. *Vector Development, free, http://www .vecdev.com*

INTERNET MANIA Not every tool in this collection is a gem, but it's still worth a modest 25 bucks. It can quickly search Internet newsgroups for keywords, put a Windows 95 Explorer face on ugly Internet server directories, notify you when your favorite sites change, search offline, and feed you stock quotes. In short, it's a small suite at a sweet price. *Corel, $24.95, 800/772-6735, http://www.corel.com*

READER SERVICE NO. 715

You can attach just about anything to a Eudora e-mail.

$15 Rebate
See www.eudora.com/pcws for details. Valid through May 31, 1997.

That's right. Not only can you send messages anywhere in the world, but there's no limit on your attachments, too. You can add Shockwave™ animations, RealAudio™ clips, video clips, and Photoshop® masterpieces as well as spreadsheets, documents, or anything else you need. No matter what size or data format, simply drag and drop them on your message.

Eudora Pro™ 3.0 is written to Internet standards and designed to work without costly, troublesome gateways that can delay or corrupt messages and attachments. So you can be sure all your attachments arrive intact. Plus, when you receive your attachments, you can easily launch them from within your message. You can do it all with Eudora,® the world's #1 Internet e-mail.

"Eudora Pro 3.0...sets a new standard for e-mail client flexibility and ease of use." —Information Week

"Eudora Pro 3.0 will continue to dominate the mail client niche of network computing." —Network Computing

To find out more, just call 1-800-2-EUDORA, ext. 27093. Or send us e-mail at eudora-sales3pcw@eudora.com. To download Eudora Pro 3.0 and use it FREE for 30 days, just visit our Web site at www.eudora.com/pcws.

EUDORA™
A DIVISION OF QUALCOMM

Circle 193 on reader service card

FREE 30-DAY TRIAL!
DETAILS AT OUR WEB SITE: WWW.EUDORA.COM/PCWS

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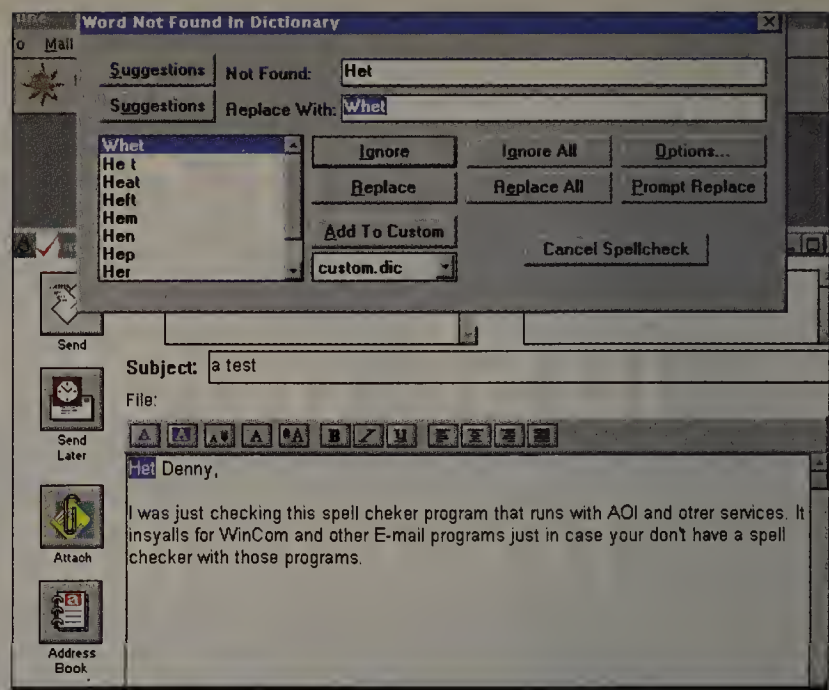
OIL CHANGE I don't change the oil in my truck myself anymore—a quick-lube joint can do it faster, and it costs about the same. Now I have a quick-lube joint for my PC. After taking stock of my installed software, Oil Change checks its database of Web and FTP sites for patches. If one is available, you can grab it immediately. *CyberMedia, $39.95 subscription, 310/581-4700, http://www.cybermedia.com* READER SERVICE NO. 716

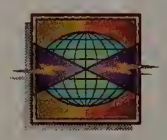
PEAK NET.JET If surfing the Web feels like swimming through molasses, turn on the jet. As you surf, Net.Jet looks at the links on each page and downloads possible paths in the background. So when you click a link, the page may already be on your hard drive where you don't have to wait for it. The caveat: Net.Jet hogs bandwidth and may deny coworkers access while you surf. *Peak Technologies, $29.95 list, 800/453-5322, http://www.peak-media.com* READER SERVICE NO. 754

SOUNDBAR Turn your e-mail into voice mail with this audio add-on to Exchange, AOL, and CompuServe. The package includes everything you need, even a mike. Record your message, then post it to your out-box as a WAV file attachment. Your recipient just double-clicks the attachment icon to listen. A few other audio tools make this a welcome substitution for the speaker icon in your Taskbar's tray. *Midisoft, $29.95 list, 800/776-6434, http://www.midisoft.com* READER SERVICE NO. 717

STARFISH INTERNET UTILITIES The core of this utility closet is QuickMarks, a bookmark organizer that tracks both favorites and bookmarks while alerting you to changes in your favorite Web sites. Built-in file compression, a clock to time your online sessions, and a Dashboard-like toolbar round out the package. A pared-down version is available free at the vendor's Web site. *Starfish Software, $39.95, 888/782-7347, http://www.starfish-software.com* READER SERVICE NO. 718



Don't look bad by misspelling words in your e-mail messages—add **AUTOSPELL** to your online toolbox.



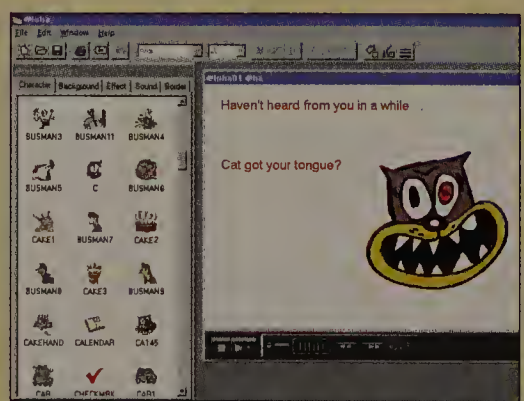
Files mentioned in this article can be found on PC World Online (http://www.pcworld.com/software_lib). Peter Scisco is a writer living in North Carolina. Steve Bass and Judy Heim are PC World *contributing editors. For more information on all products in this article, circle reader service number 907.* ■

Fun Fun Fun (Till Her Daddy Takes the T1 Away)

WHILE YOU'RE FILLING UP your Internet tool kit, don't forget to stick a couple of goodies in there for R&R. After all, all surf and no play can make you a very dull bot.

@LOHA Add some sparkle to your e-mail messages with this simple animation creator, which works with any e-mail system that allows attachments. Use the program's libraries to design a dancing, singing, moving greeting card. It's a lot more fun than buying from Hallmark. *Media Synergy, $49.95 list, 800/793-6320, http://www.mediasyn.com* READER SERVICE NO. 724

CASTLE INFINITY When you're not busy protecting your kids from obscene and violent Web sites, why not let them have a little fun with Castle Infinity? This program enables children to design and control an avatar for a special entertainment site. Your kids can make virtual friends who can help solve puzzles, overcome obstacles, and defeat such monsters as the dreaded Brain-sucker. Cooperation is the name of the game here, with more than one player required to work some of the gadgets. *Starwave, $39.95 list, 800/457-8646, http://www.castleinfinity.com* READER SERVICE NO. 725



Say hi with animated e-mail messages that you create with **@LOHA**.

COMIC CHAT Want to create a vicarious life in an ongoing series of 2-by-2 panels? Unlike standard Net chat rooms, where the best stories disappear into the ether, Comic Chat can save your comic strip adventure as a document that you can read later. *Microsoft, free, http://www.microsoft.com/ie/comichat/download.htm*

—*P. S.*

AFTER IDENTIFYING
WHAT THIS WAS,
JEEP ENGINEERS
MASTERED IT.

INTRODUCING THE NEW

Obviously our engineers spend most of their time off-road. However, all that off-road expertise makes handling the hard, smooth stuff, well, easy. The latest example of all that engineering expertise—the Jeep® Grand Cherokee TSi.

What you'll notice first about the TSi are the aggressive 16-inch alloy wheels fitted with high-performance Goodyear® Eagle LS tires, a setup usually reserved for those autobahn cruisers.

Step inside and you'll find perforated leather-faced seats, a 10-way power driver's seat, and radio controls located right on the steering wheel.

When you eventually tire of all that civilized driving, take the TSi off-road. Remember, Grand

Always wear your seat belt. Jeep is a registered trademark of Chrysler Corporation.

GRAND CHEROKEE TSi

Cherokee TSi is a Jeep vehicle first, as proven by its highly advanced Quadra-Trac® four-wheel drive.

Underneath it all is an available 220-horse V8 that has more than enough power whether you're on mud and rocks or—what's that word again? Oh yes, pavement. Now if our engineers could just figure out what those painted lines are for. For more information, call 1-800-925-JEEP or visit our Web site at http://www.jeepunpaved.com

Jeep

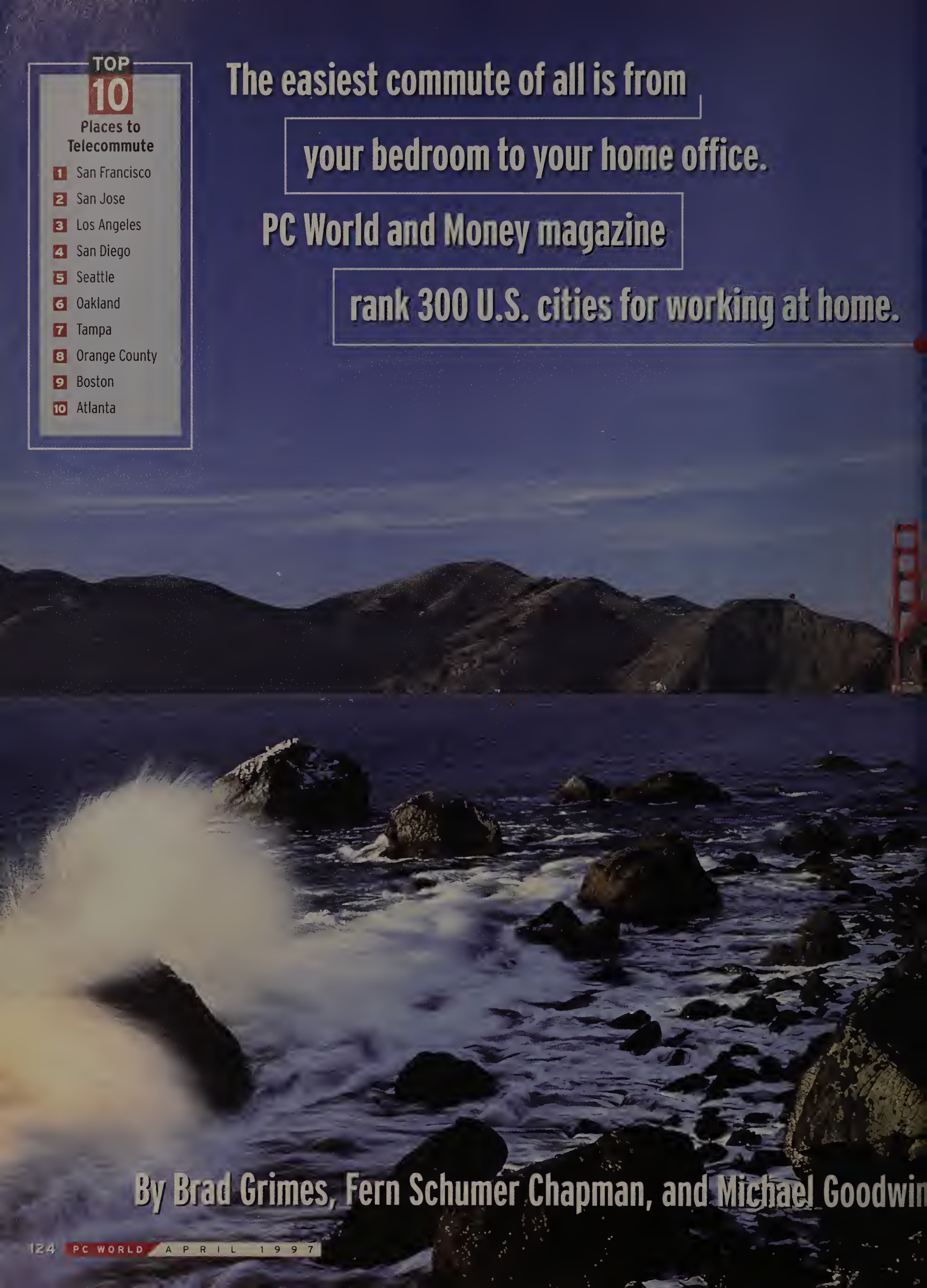
THERE'S ONLY ONE

TOP 10

Places to Telecommute

1. San Francisco
2. San Jose
3. Los Angeles
4. San Diego
5. Seattle
6. Oakland
7. Tampa
8. Orange County
9. Boston
10. Atlanta

The easiest commute of all is from your bedroom to your home office. PC World and Money magazine rank 300 U.S. cities for working at home.

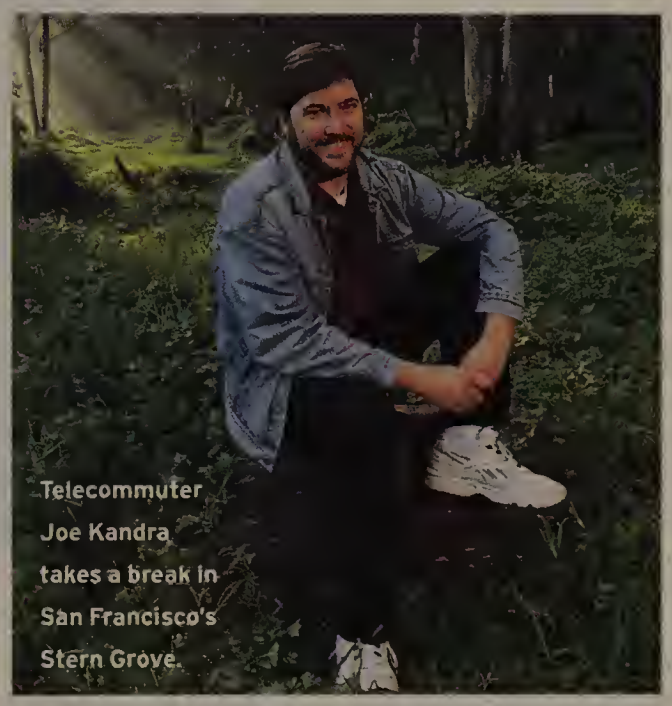


By Brad Grimes, Fern Schumer Chapman, and Michael Goodwin

Telecommuters' Guide

Best Places to Live and Work

WHEN JOE KANDRA needs a break from work, he takes his dog Kali and heads for the woods. The fragrant eucalyptus trees of Stern Grove are over an hour's drive from Cisco Systems, where Joe works as a digital media specialist. But they're just a short walk from his home office, a little room off his kitchen in the Parkside section of San Francisco. "I love that 10-foot commute from the bedroom," he says with a laugh. Like thousands of San Franciscans, Joe works from his home a few days a week. And why not? He lives in the best city in America for telecommuting.

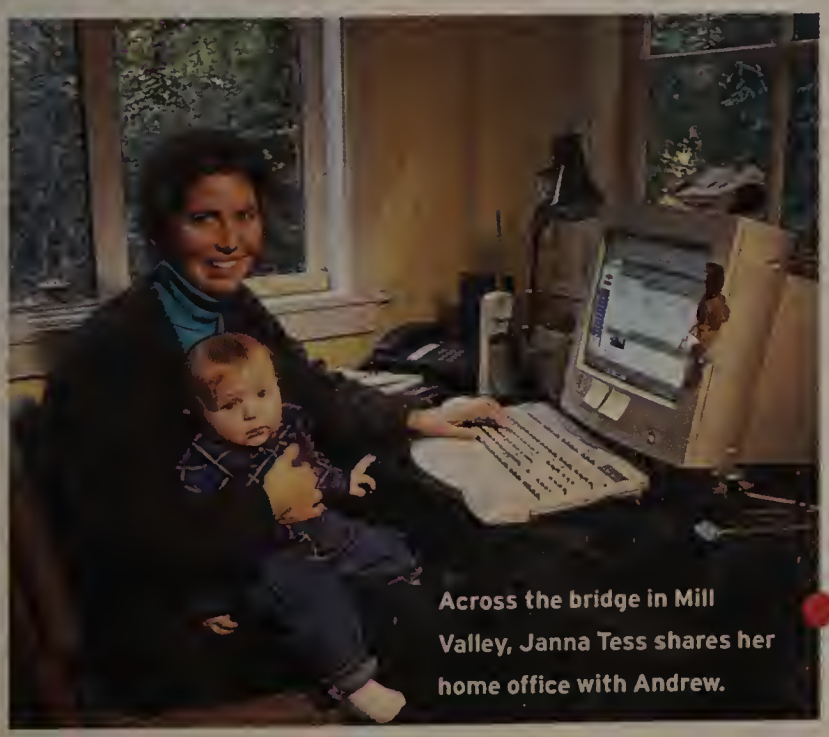


Telecommuter Joe Kandra takes a break in San Francisco's Stern Grove.

These days, if you've got a desk, a PC, and a phone, you can work from almost anywhere. But when it comes to running a home office, some cities offer clear advantages—from the quality of their communications services to their concentration of good coffee shops.

With help from *Money* magazine, we've uncovered the best places for working from home. We took data from *Money*'s annual quality-of-life report on the 300 largest U.S. metropolitan areas and combined this information with our own research on telephone services, Internet access, courier services, copy centers, and more.

When we totaled up the numbers, San ▶



Across the bridge in Mill Valley, Janna Tess shares her home office with Andrew.

LANDSCAPE: COSMO CONDINA/TONY STONE; PORTRAITS: ANDY FREEBERG; ICON: TIM CARROLL

Francisco landed at the top of our list. The City by the Bay offers the ideal combination of business resources, technological know-how, and quality of life. It pulses with the energy of young media companies; it courses with cash from financial institutions like Charles Schwab and the Pacific Stock Exchange; it sings with the sounds of cable cars and Chinese markets. And that clicking noise? That's the steady cadence of San Francisco's telecommuters checking their e-mail.

IN SAN FRANCISCO, every vista is a picture postcard. From North Beach to Chinatown, from sunny streets to the moonlit bay, the city has something for everyone, including an unbeatable mix of old-world charm and high-tech know-how.

THE REST OF THE BEST

ON THE WHOLE, the Golden State is golden for telecommuting. After San Francisco, five more California metropolitan areas grace our Top 10: **San Jose** (number two), **Los Angeles** (number three), **San Diego** (number four), **Oakland** (number six), and **Orange County** (number eight). The reasons are simple: gorgeous weather, a rebounding economy, and some of the most technologically savvy companies in the world.

Like our California cities, number five **Seattle** and number nine **Boston** boast a strong technology base. Our two southern cities—**Tampa** (number seven) and **Atlanta** (number ten)—are beginning to embrace telecommuting, but they already have what it takes to make the Top 10.

Big cities dominate our list, and for good reason. They typically offer the resources you need for running an office away from *the* office. Number one on the list: high-speed communications. If you need to move files or use the corporate network, you'll want a fast ISDN line, which is often most widely available in large metro areas. You'll also need a reliable Internet connection and good, cheap phone services.

But that's only the beginning. What if you run out of printer paper the day a proposal is due? Tampa has a lot of office supply stores. Do you absolutely, positively have to send out that proposal by 7 p.m.? Los Angeles and Atlanta have plenty of Federal Express and UPS offices. Of course, you'll also need to get the thing copied, collated, and bound. For that last-minute trip to Kinko's, San Francisco is king—it's got more copy centers per capita than any other area of the country.

So much for work. What makes a city a good place to live? The experts at *Money* magazine provided us data in nine categories, from the arts and economy to housing and education. With seven of our top cities in California or Florida, a mild climate, a lively arts scene, and a wide range of recreational pursuits are givens.

In San Francisco, for example, you can stroll along the bay on a warm, sunny morning; have dim sum in Chinatown for lunch; and enjoy the opera at night. In fact, four of our top cities—San Francisco, San Jose, San Diego, and Tampa—rank in the Top 10 on the merits of their quality of life alone. (See our rankings of all 300 cities on page 128.)

MAYBERRY GOES DIGITAL?

"SOME PEOPLE THINK telecommuting means they can sit in a log cabin on a hillside five hours from anywhere," says Gil Gordon, a consultant and editor of the *Telecommuting Review*. "Unfortunately, that isn't reality in most cases."

So maybe settling down by a babbling brook with a notebook PC can't work for everybody. Still, there are several smaller cities that combine a wonderful lifestyle with telecommuting resources. **Raleigh-Durham-Chapel Hill, North Carolina** (population 965,127) is our top midsize metro area, thanks in part to a low unemployment rate and high concentration of Internet access numbers.

If you want to get even smaller, there's **Manchester, New Hampshire** (population 177,470), just 50 miles north of Boston. Manchester's biggest lure is New Hampshire's lack of sales and income tax. Working at home is made easy by the city's computer stores and copy centers.

CLOCKWISE FROM TOP: ANDY FREEBERG, CHUCK PEFLEY/TONY STONE, PHIL SCHERMEISTER/TONY STONE, ANDY FREEBERG, WILLIAM S. HEYSEL/TONY STONE

But small does not always mean beautiful. Take our number 300 city, **Lima, Ohio** (population 155,856). It suffers from a stagnant economy and high crime rate. Lima also falls short in telecommuting resources. It has few Internet access numbers (the West Central Ohio Internet Link is the area's regional provider) and as of this writing, no ISDN service.

NO PLACE LIKE IT

WORKING AT HOME is a great way to spend more time with your family, avoid an unpleasant commute, or simply get more work done in less time. And the cities in our Top 10 are great places to do it. If you're looking for a good place to telecommute, you've got to ask the same questions as you would when shopping for a new job in a different location: Does the city you're considering offer the social, cultural, and educational opportunities you want?

When it comes to San Francisco and the rest of our Top 10, the answer is an emphatic yes.

The information mentioned in this article is available on PC World Online (http://www.pcworld.com/apr97/telecommute). Brad Grimes is a senior associate editor for PC World. *Fern Schumer Chapman lives and works near Chicago and has written for* Forbes, Fortune, *and* U.S. News & World Report. *Michael Goodwin is a frequent contributor based in New Orleans.*

San Francisco, California

Within metro area: Marin County, San Mateo
Three-bedroom house: $356,435
Projected job growth to 2001: 5.1 percent
Typical ISDN installation fee: $125
Basic rate for two phone lines: $22.50
Annual sunny days: 265

IN A CITY WHERE every new company seems to be an Internet startup, it pays to be wired. Joe Kandra knows. His job is to create multimedia presentations for Cisco Systems, a networking company in San Jose. Without his ISDN line, Joe wouldn't be able to move the huge multimedia files he creates at home.

"Sometimes it's a faster connection than [the one] in my cubicle," he says. "And hooking up was simple."

If you've tried to get ISDN for your home, you may not share Joe's luck with the service. But in San Francisco, Pacific Bell has taken strides to make the high-speed lines widely available (though not 100 percent available) and easy to use.

San Francisco also offers a high concentration of copy centers and an abundance of Internet access numbers.

More important, San Francisco is a super place to live. (Coincidentally, it's also the home of *PC World*.) There are more restaurants per capita here than in any other U.S. city. Its world-class arts scene includes such renowned performing groups as the San Francisco Opera, Ballet, and Symphony; the Museum of Modern Art has a new building that is itself a work of art; and Golden Gate Park is a perfect setting in which to enjoy the city's cool foggy summers and warm winters.

As a whole, the Golden State is golden for telecommuting.

For those who feel the lure of San Francisco but are wary of city life, the metro area includes picturesque Marin County, where towns like Sausalito rest within view of the San Francisco skyline.

Janna Tess, a buyer for the Smith and Hawken garden store, telecommutes from her home in Marin's Mill Valley. She started working at home following the birth of her son Andrew.

Besides phoning vendors and sending e-mail, Tess can dial in to Smith and Hawken's inventory management system to check on her products.

Tess loves the San Francisco area, especially Mill Valley. "It's at the base of Mount Tamalpais, so it's a great launchpad for outdoor activities." Because her hours are flexible when she telecommutes, she can enjoy her surroundings whenever the fancy strikes.

With so many ways to work and enjoy yourself, San Francisco and its environs are a haven for telecommuters. As Joe Kandra admires a view of eucalyptus trees, he says quietly, "We like it here." We'd have to agree.

San Jose, California

Within metro area: Palo Alto, Sunnyvale
Three-bedroom house: $225,000
Projected job growth to 2001: 8 percent
Typical ISDN installation fee: $125
Basic rate for two phone lines: $22.50
Annual sunny days: 257

SURE, SAN JOSE lies at the very heart of the computer industry, but if you're expecting the city to be one big industrial park, you're in for a surprise. Burgeoning San Jose is incredibly livable, with a diverse population, a start-up-happy business climate, and plenty of warm, clear days. San Jose's role as the technology capital of the United States gives it a leg up on most cities when it comes to telecommuting because companies there don't suffer from technophobia.

Bob Nguyen can't afford to be afraid of technology. As one of IBM's "mobile employees," this sales rep's office is anywhere he hangs his hat. "They gave me a ThinkPad with a modem," he explains, "and I can work anywhere I want to. Actually, the only office I'm supposed to be in is my customer's office.

"All of our marketing material is given to us online," he says, "so I just download it, find a printer, and print out updated brochures." When he needs to send documents to the home office, he picks ▶

CON LEFT JEFFREY PELO ICON RIGHT TIM CARROLL

How the 300 Biggest Cities Rank for Telecommuting:

Top 10 Cities

		QUALITY OF WORK	ISDN Service	Phone Service	Internet Access	Courier Service	Copy Centers	Office Supplies	Computer Supplies
1	San Francisco, CA	68	71	95	92	100	83	95
2	San Jose, CA	68	71	67	89	76	79	80
3	Los Angeles, CA	68	71	95	100	72	86	60
4	San Diego, CA	68	71	79	89	84	57	71
5	Seattle, WA	76	74	88	94	81	65	70
6	Oakland, CA	68	71	95	67	83	74	75
7	Tampa, FL	60	57	76	77	55	88	74
8	Orange County, CA	68	71	87	32	68	71	93
9	Boston, MA	84	38	100	74	75	85	64
10	Atlanta, GA	63	87	70	100	73	78	62

Rest of the Pack

11 Fort Lauderdale, FL
12 Riverside-San Bernardino, CA
13 Miami, FL
14 Orlando, FL
15 Houston, TX
16 Washington, DC
17 Portland, OR
18 Raleigh-Durham-Chapel Hill, NC
19 Phoenix, AZ
20 Chicago, IL
21 Dallas, TX
22 Memphis, TN
23 Sarasota-Bradenton, FL
24 West Palm Beach-Boca Raton, FL
25 Nashville, TN
26 Baltimore, MD
27 Newark, NJ
28 Salt Lake City-Ogden, UT
29 Santa Barbara, CA
30 Manchester, NH
31 Detroit, MI
32 Jacksonville, FL
33 Gainesville, FL
34 Nashua, NH
35 Bryan-College Station, TX
36 Austin, TX
37 Brevard County, FL
38 Minneapolis-St. Paul, MN
39 Charlotte, NC
40 Las Vegas, NV
41 Denver, CO
42 Ventura, CA
43 Fort Myers-Cape Coral, FL
44 Naples, FL
45 Boulder, CO
46 Long Island, NY
47 New York, NY
48 Madison, WI
49 Knoxville, TN
50 Fort Pierce-Port St. Lucie, FL
51 New Orleans, LA
52 Bergen-Passaic counties, NJ
53 Santa Rosa, CA
54 San Luis Obispo, CA
55 Portsmouth, NH
56 Santa Cruz, CA
57 Sacramento, CA
58 Lakeland-Winter Haven, FL
59 Daytona Beach, FL
60 San Antonio, TX
61 Tucson, AZ
62 Greenville-Spartanburg, SC
63 Wilmington, DE
64 Cleveland-Lorain-Elyria, OH
65 Olympia, WA
66 Punta Gorda, FL
67 Rochester, MN
68 Provo-Orem, UT
69 Sioux Falls, SD
70 Fort Worth-Arlington, TX
71 Pittsburgh, PA
72 Greensboro-Winston-Salem, NC
73 Fort Collins, CO
74 Columbus, OH
75 Tacoma, WA
76 Bellingham, WA
77 Reno, NV
78 Monmouth-Ocean counties, NJ
79 Columbia, SC
80 Norfolk-Virginia Beach, VA
81 Tallahassee, FL
82 Monterey-Salinas, CA
83 Fort Walton Beach, FL
84 Indianapolis, IN
85 Lexington, KY
86 Pensacola, FL
87 Mobile, AL
88 Dothan, AL
89 Middlesex-Somerset-Hunterdon counties, NJ
90 Boise, ID
91 Birmingham, AL
92 Salem, OR
93 Abilene, TX
94 Honolulu, HI
95 Montgomery, AL
96 Worcester, MA
97 Chattanooga, TN
98 Albuquerque, NM
99 Charleston, SC
100 Bremerton, WA
101 Bakersfield, CA
102 Charlottesville, VA
103 Lafayette, LA
104 Albany, GA
105 Hagerstown, MD
106 Fresno, CA
107 Johnson City, TN
108 Stamford-Norwalk, CT
109 Lowell, MA
110 Ann Arbor, MI
111 Fargo, ND
112 Huntsville, AL
113 Roanoke, VA
114 Athens, GA
115 Wilmington, NC
116 Monroe, LA
117 Vallejo-Fairfield-Napa, CA
118 Amarillo, TX
119 Eugene-Springfield, OR
120 Colorado Springs, CO
121 Grand Rapids-Muskegon, MI
122 Savannah, GA
123 Richmond, VA
124 St. Louis, MO
125 Philadelphia, PA
126 Baton Rouge, LA
127 Little Rock, AR
128 Bloomington, IN
129 Biloxi-Gulfport, MS
130 Panama City, FL
131 Columbus, GA
132 Corpus Christi, TX
133 Portland, ME
134 Kansas City, MO
135 Lynchburg, VA
136 Asheville, NC
137 Lubbock, TX
138 Jackson, MS
139 Milwaukee, WI
140 Odessa-Midland, TX
141 Providence, RI
142 Oklahoma City, OK
143 Chico-Paradise, CA
144 Medford-Ashland, OR
145 Lawrence, MA
146 Fitchburg, MA
147 Cincinnati, OH
148 Clarksville, TN
149 Spokane, WA
150 Wheeling, WV
151 Fayetteville, AR
152 Lincoln, NE
153 Springfield, MA
154 El Paso, TX
155 Hattiesburg, MS
156 Greenville, NC
157 Tuscaloosa, AL
158 Greeley, CO
159 Duluth, MN
160 Texarkana, TX
161 Redding, CA
162 Scranton-Wilkes Barre, PA
163 Bridgeport, CT
164 Decatur, AL
165 Lansing, MI
166 Gary, IN
167 Brownsville, TX
168 Springfield, MO
169 Cedar Rapids, IA
170 Shreveport-Bossier City, LA
171 Goldsboro, NC
172 Lafayette, IN
173 Burlington, VT
174 McAllen, TX
175 Galveston, TX
176 Appleton-Oshkosh, WI
177 Barnstable-Yarmouth, MA
178 Myrtle Beach, SC
179 Des Moines, IA
180 Hickory, NC
181 Kalamazoo-Battle Creek, MI
182 Tyler, TX
183 Ocala, FL
184 Lake Charles, LA
185 Buffalo-Niagara Falls, NY
186 Omaha, NE
187 Brockton, MA
188 Sheboygan, WI
189 Kenosha, WI
190 Macon, GA
191 Augusta, GA
192 Houma, LA
193 Waco, TX
194 Columbia, MO
195 Dutchess County, NY

San Francisco Combines the Best of Work and Play.

QUALITY OF LIFE	Economy	Health	Crime	Housing	Education	Weather	Transit	Leisure	Arts
	39	63	46	19	66	87	72	100	98
	51	63	56	32	59	87	51	97	93
	33	53	45	35	79	90	38	86	80
	45	58	50	28	61	100	42	87	53
	72	58	47	24	56	52	67	92	68
	40	58	43	22	54	84	62	98	93
	82	43	42	59	62	80	29	68	54
	55	53	54	11	40	94	27	85	75
	48	98	56	19	62	49	64	81	92
	67	35	42	36	75	61	55	61	54

RATING: Scores are on a scale of 1 to 100, with 100 being the top score.

196 Laredo, TX
197 Brazoria, TX
198 Rochester, NY
199 Longview, TX
200 Beaumont, TX
201 Lancaster, PA
202 Louisville, KY
203 Muncie, IN
204 Green Bay, WI
205 Danbury, CT
206 Hartford, CT
207 Pueblo, CO
208 Harrisburg, PA
209 State College, PA
210 New Bedford, MA
211 Killeen-Temple, TX
212 Anchorage, AK
213 Danville, VA
214 Altoona, PA
215 Rocky Mount, NC
216 New Haven, CT
217 Billings, MT
218 Modesto, CA
219 Visalia-Tulare-Porterville, CA
220 Youngstown, OH
221 Trenton, NJ
222 Florence, AL
223 St. Cloud, MN
224 Fort Wayne, IN
225 Dayton, OH
226 Allentown-Bethlehem-Easton, PA
227 South Bend, IN
228 Akron, OH
229 Syracuse, NY
230 Wichita Falls, TX
231 Richland, WA
232 Stockton, CA
233 Yakima, WA
234 Saginaw-Bay City-Midland, MI
235 Evansville, IN
236 Fayetteville, NC
237 Anniston, AL
238 Tulsa, OK
239 Yolo, CA
240 Champaign-Urbana, IL
241 Wichita, KS
242 La Crosse, WI
243 Steubenville, OH
244 Florence, SC
245 Merced, CA
246 Charleston, WV
247 Newburgh, NY
248 Jacksonville, NC
249 Toledo, OH
250 Canton-Massillon, OH
251 Jamestown, NY
252 Las Cruces, NM
253 Dover, DE
254 Bloomington-Normal, IL
255 York, PA
256 New London, CT
257 Binghamton, NY
258 Hamilton, OH
259 Joplin, MO
260 Davenport, IA
261 Huntington, WV
262 Sharon, PA
263 Flagstaff, AZ
264 Eau Claire, WI
265 Yuma, AZ
266 Lawton, OK
267 Albany-Shenectady-Troy, NY
268 Terre Haute, IN
269 Reading, PA
270 Fort Smith, AR
271 Flint, MI
272 Topeka, KS
273 Waterloo, IA
274 Johnstown, PA
275 Racine, WI
276 Waterbury, CT
277 Springfield, IL
278 Erie, PA
279 Cumberland County, NJ
280 Hudson County, NJ
281 Janesville-Beloit, WI
282 Williamsport, PA
283 Alexandria, LA
284 Parkersburg, WV
285 Peoria, IL
286 Utica-Rome, NY
287 Yuba City, CA
288 Jackson, MI
289 Elkhart-Goshen, IN
290 Decatur, IL
291 Santa Fe, NM
292 Rockford, IL
293 Atlantic-Cape May counties, NJ
294 Glens Falls, NY
295 Benton Harbor, MI
296 Sumter, SC
297 Wausau, WI
298 Sioux City, IA
299 Mansfield, OH
300 Lima, OH

How We Ranked Them

WE BEGAN WITH the 300 largest metropolitan areas in the country, according to the U.S. Census Bureau. We then joined forces with *Money* magazine, whose annual survey, "Best Places to Live in America," ranks cities based on their quality of life. *Money* provided data from government and private sources such as the FBI, Century 21 real estate brokers, NPA Data Services, the American Chamber of Commerce Researchers Association, and the Environmental Protection Agency. *PC World* researchers collected data on telecommuting-related conditions from local phone companies, Internet service providers, courier services, and databases. Fast Forward, a demographic consulting firm in Portland, Oregon, pulled the data together and assigned points in each category. From there we weighted each metro area's scores and came up with the ranking. Quality of life categories are weighted based on a survey conducted by *Money*. Quality of work factors are weighted based on information provided by Gil Gordon, publisher of the monthly newsletter *Telecommuting Review* (908/329-2266), and Jack M. Nilles, author of *Making Telecommuting Happen* (Van Nostrand Reinhold, 1994, 800/842-3636).

PC WORLD
Money

Create your own ranking of top places to work at home on our Web site (http://www.pcworld.com/apr97/telecommute). –B. G. ▶

One World

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The privacy issue affects everyone in your company, not just readers of this magazine. So tear out this ad and post it someplace public.

DON'T LET L.A.'s mellow reputation fool you. When it comes to telecommuting, the city is wired. Just ask Nickelodeon executive Robbie Rowe, who splits time between her home and her office.

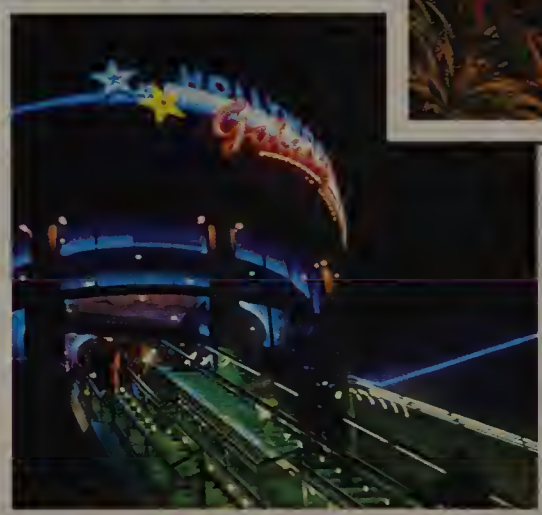
from an abundance of courier services.

When San Jose workers put down their notebook PCs, there are plenty of ways to relax, including (go figure) the Tech Museum of Innovation, the symphony, and the repertory theater. And despite San Jose's nerdy legacy, it's taken to pro sports like a fish to water. Don't miss the hockey-playing Sharks—there's nothing like an arena full of techno-types cheering to the theme music from *Jaws*.

Los Angeles, California

Within metro area: Long Beach, Pasadena
Three-bedroom house: $193,586
Projected job growth to 2001: 4 percent
Typical ISDN installation fee: $125
Basic rate for two phone lines: $22.50
Annual sunny days: 258

IF YOU'VE HEARD SOME of the horror stories about Los Angeles's freeways, you know why the City of Angels is a hotbed of telecommuting. Sure, the glitz can get weird. And the smog is, well, breathtaking. But Los Angeles offers telecommuters respite from all that. The city's assets include great weather, reasonable electricity and phone rates, and a plethora of Internet access numbers. And, of course, more entertainment than you can shake a breadstick at.



Robbie Rowe knows the entertainment biz. She also knows the benefits of working at home. This vice president at the Nickelodeon cable TV network wants to spend time with her 4-year-old daughter Georgia. She does it by working from home mornings and evenings.

"I supervise a division that lives on both coasts, so I can deal with New York early," Rowe says. This entails a 7 a.m. conference call from home with Georgia on her lap. In fact, Rowe's home is one big communication hub, with phone, fax, and modem lines. She uses the Internet, plus a remote access program for checking her office's e-mail system. About the only thing missing is a videoconferencing line, and she frankly doesn't want one. "The East Coast people all go home by 4 o'clock my time," Rowe says with a laugh, "so nobody cares where I am."

San Diego, California

Within metro area: Coronado, Escondido
Three-bedroom house: $173,000
Projected job growth to 2001: 10 percent
Typical ISDN installation fee: $125
Basic rate for two phone lines: $22.50
Annual sunny days: 267

TAKE A TEMPERATE, sun-kissed climate. Add a laid-back lifestyle, and finish the rosy picture with an efficient transit system. Heaven? No, it's San Diego, and it's easy to see why investment manager Bill Carter loves telecommuting here.

"The transportation situation in San Diego has genuinely affected our decision on where to keep our business," says Carter, who is a partner in the three-year-old firm Chi Investment Management. "State taxes are high, but the ability to get around easily is so valuable to us that we've continued to stay."

Though his office is only ten miles from his bedroom, Carter spends about 80 percent of his work week at home or out visiting ▶

TOP 10

Small Places to Work at Home

(Population less than 250,000)

1. Manchester, NH
2. Gainesville, FL
3. Nashua, NH
4. Bryan-College Station, TX
5. Naples, FL
6. Boulder, CO
7. San Luis Obispo, CA
8. Portsmouth, NH
9. Santa Cruz, CA
10. Olympia, WA

CLOCKWISE FROM TOP: ANDY FREEBERG, ANN SUMMA, PETE SALOUTOS/TONY STONE, CHAD SLATTERY/TONY STONE; ICONS, TIM CARROLL

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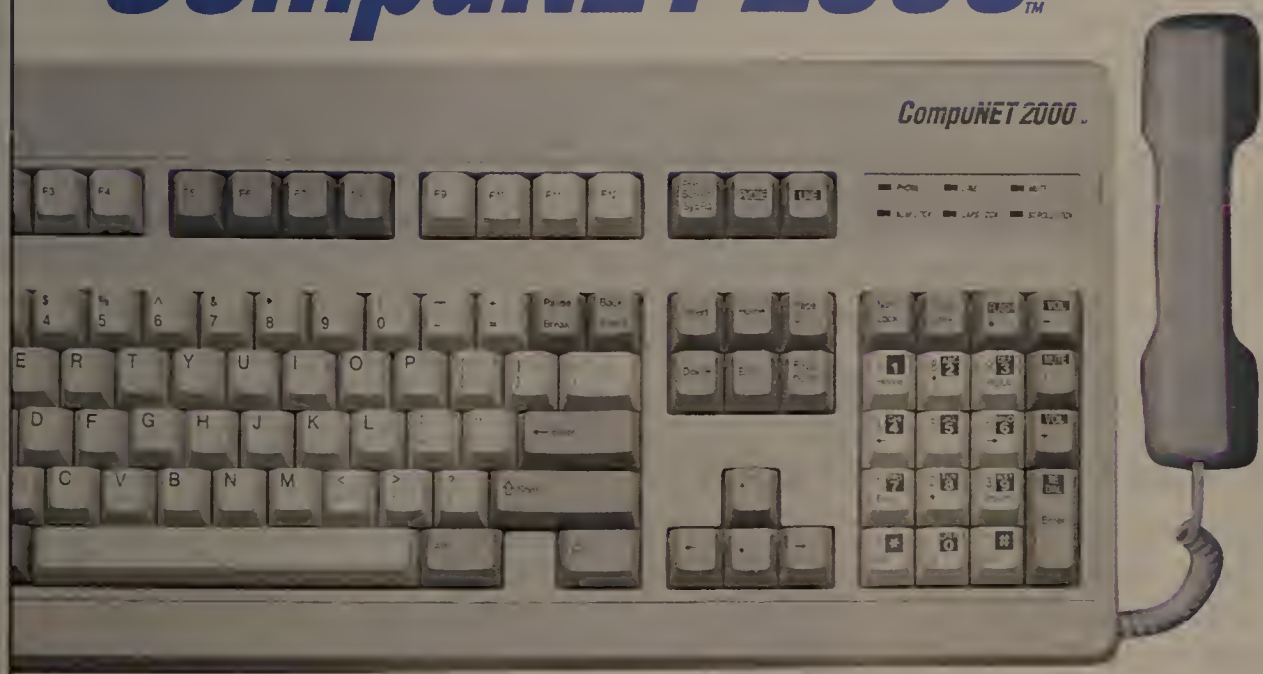

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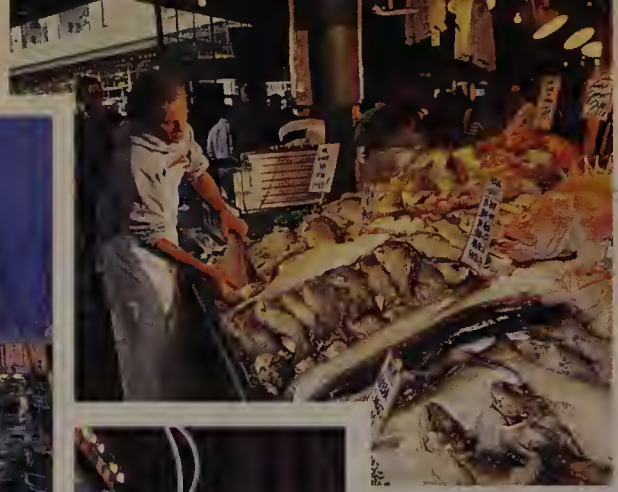
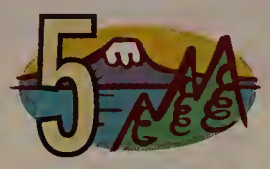


BEYOND THE DIN of Seattle's fish markets and coffee houses you can hear software being born. Engineer Tim Catura-Houser towers above The City That Bill Built.

clients. "My work lends itself to telecommuting," he says. Using LapLink for Windows 95, Carter says he can do everything online—except meet with clients. "For that," he says, "you only need a conference room."

The living in San Diego is great. It's relatively affordable for California, and if sailing or lying about in the picture-perfect weather don't strike your fancy, you can check out the famous San Diego Zoo, or travel off the beaten path to the San Diego Model Railroad Museum, the largest of its kind in the world.

But it's the real choo-choos that win Carter's heart. "Here in San Diego," he says, "I don't even need a car. I can do it all on the trolley."



Seattle, Washington

Within metro area: Bellevue, Everett
Three-bedroom house: $173,344
Projected job growth to 2001: 10 percent
Typical ISDN installation fee: $85
Basic rate for two phone lines: $21
Annual sunny days: 136

A LEGEND ABOUT Microsoft reveals the work culture in many Seattle companies. It goes like this: Bill Gates is walking behind a Microsoft employee who complains, "These 12-hour days are just killing me." Gates quips, "So you're working half-days again, eh?"

In a city where 18-hour work days are common, telecommuting plays an enormous role. And thanks to the hundreds of businesses that have sprung up around Gates's little software venture, Seattle is a telecommunications mecca. Phone services are cheap, and you can pay low flat rates for ISDN service. What's more, the overall cost of living in Seattle is a lot lower than its high-tech neighbors to the south, and Washington state has no income tax.

"Telecommuting helps you be much more efficient in your 18-hour days," says Tim Catura-Houser, a senior engineer with des Cartes, a firm that supports other computer engineers.

Catura-Houser spends half of each day working remotely and the other half on site. He uses Microsoft NetMeeting to diagnose a client's computer over the Internet while speaking to the client at the same time.

Seattle's many coffee shops prove the **art** of conversation isn't lost.

But Seattle isn't all work and no play. The city's bevy of coffee shops prove that the art of casual conversation isn't lost. If you don't mind the long months of gray skies, you can take advantage of the nearby Cascade and Olympic mountains, and Puget Sound is great for boaters.

So what does Catura-Houser do for fun? "Well," he says "last weekend, I put up a satellite dish." Sounds suspiciously like more work to us.

Oakland, California

Within metro area: Alameda, Berkeley
Three-bedroom house: $228,500
Projected job growth to 2001: 5.6 percent
Typical ISDN installation fee: $125
Basic rate for two phone lines: $22.50
Annual sunny days: 260

ACROSS THE BAY BRIDGE from San Francisco is sunny Oakland, where homes are easier to find and many telecommuters have set up shop. No wonder. Oakland enjoys the same telecommuting advantages as other high-tech Bay Area cities like San Francisco and San Jose, ▶

CLOCKWISE FROM LEFT: CONNIE COLEMAN/TONY STONE, RICH FRISHMAN, ANDY FREEBERG, JOEL ROGERS/TONY STONE; ICONS: TIM CARROLL

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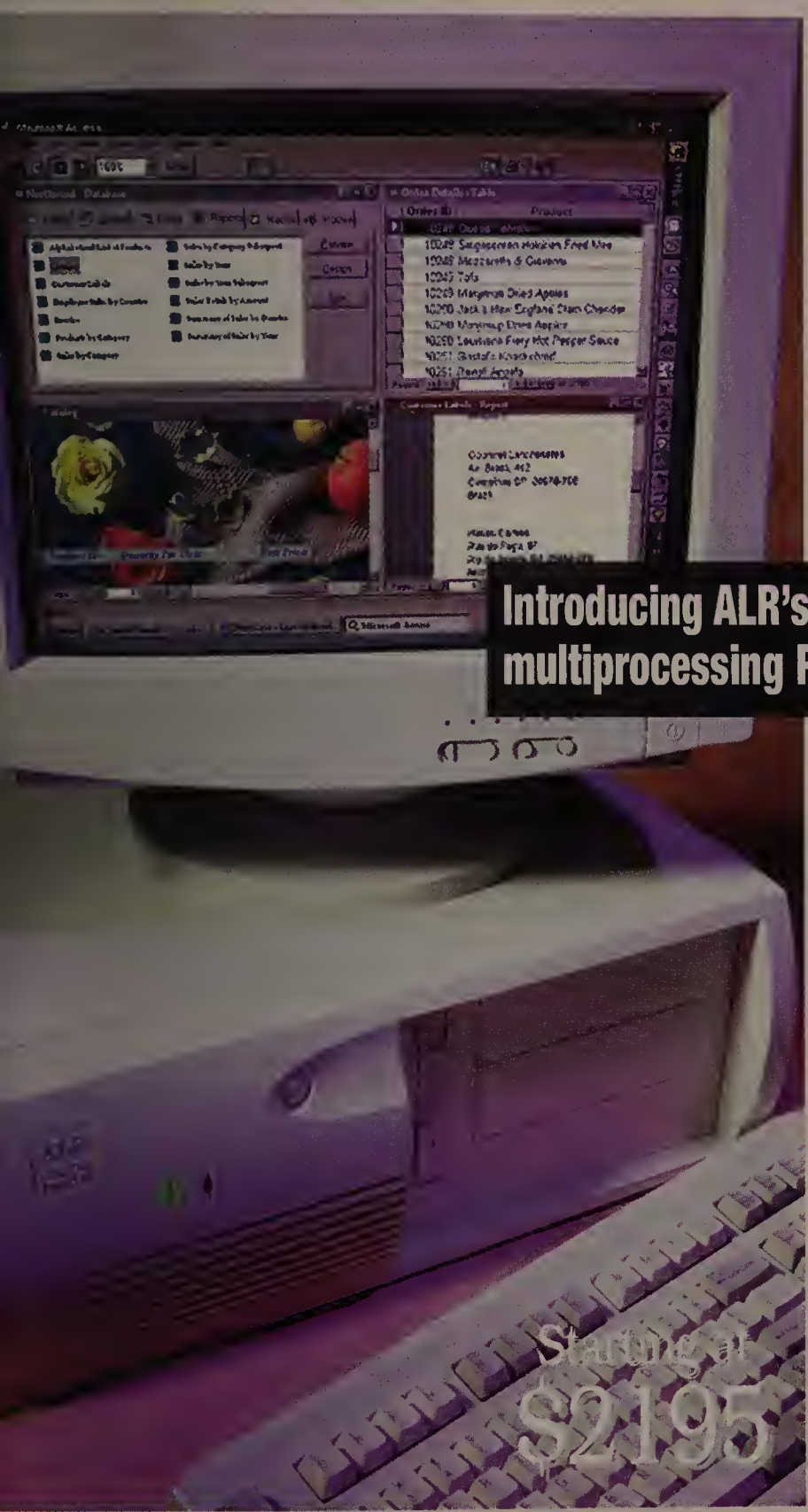

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Circle 9 on reader service card

but without the same hustle and bustle.

"Oakland is a great place to live, especially for my kids," says Sam Hammond, a computer programmer and Internet consultant. But he adds, "The freeways are impossible. I just can't spare the time to get stuck in traffic, so I work at home most days."

That's where Oakland's widespread Internet access comes in. Says Hammond, "My clients are usually on the Net, so it's easy for me to FTP files back and forth. A lot of the time, I just leave my computer on so clients can dial in."

Less time in traffic means more time for Hammond and his neighbors to enjoy Oakland's gold mine of multicultural amusements: jazz clubs, Trinidadian restaurants, specialty record stores, the Oakland Symphony, and more.

TOP 10

Midsize Places to Work at Home

(Population 250,000 to 999,999)

1. Raleigh-Durham-Chapel Hill, NC
2. Sarasota-Bradenton, FL
3. West Palm Beach-Boca Raton, FL
4. Santa Barbara, CA
5. Jacksonville, FL
6. Austin, TX
7. Brevard County, FL
8. Ventura, CA
9. Fort Myers-Cape Coral, FL
10. Madison, WI

Tampa, Florida

Within metro area: Clearwater, St. Petersburg

Three-bedroom house: $95,000

Projected job growth to 2001: 10.6 percent

Typical ISDN installation fee: $190

Basic rate for two phone lines: $22.74

Annual sunny days: 238

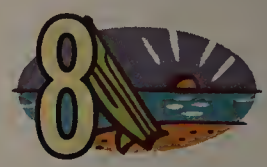
FOR NICKY VALENTINI, using the Internet can literally be a matter of life or death. A professional guardian in Tampa, Valentini looks out for the interests of sick and elderly people who are unable to do so themselves. She depends on e-mail, the Internet, and courier services to communicate with legal, medical, and financial professionals.

"I have a gerontologist who works with me, and she e-mails me all her progress notes. This means I get them the same day, which can be very important when my clients need immediate action."

Telecommuting is less common in Tampa than in other metropolitan areas, but it is catching on. ISDN service is available at flat rates, and the region has lots of office supply stores.

Like its sunny climate, Tampa's economic prospects are warm and rosy. Job growth is expected to race ahead over the next few years. Although home values are appreciating at a double-digit rate, the average price of a three-bedroom house still remains below $100,000.

"Tampa is a medium-size city," says Valentini, "neither so big you can get lost nor so small that there's nothing to do." She's right. There's plenty to do and see, from some of the most beautiful seashores in the nation, to the Sea World park, to the famous Salvador Dali Museum. Of our Top 10 cities, Tampa is where you'll most likely need sunblock before dashing off to the local copy center.



Orange County, California

Within metro area: Anaheim, Irvine, Santa Ana

Three-bedroom house: $187,000

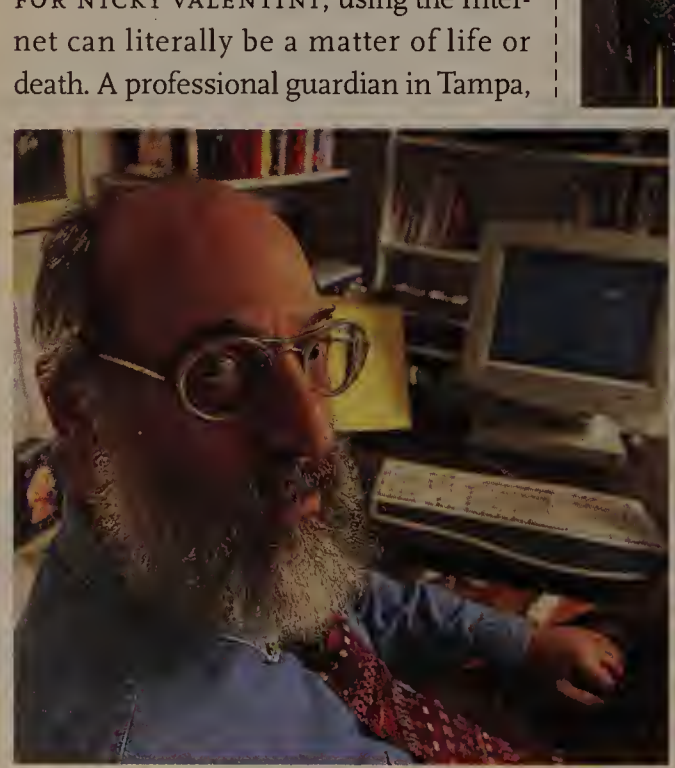
Projected job growth to 2001: 10.7 percent

Typical ISDN installation fee: $125

Basic rate for two phone lines: $22.50

Annual sunny days: 258

SITUATED ON THE southeastern border of L.A.'s urban sprawl, Orange County is a telecommuting explosion waiting to happen. "It's an employee's market here," says John Grefe, president of Orange County's Telecommuting Advisory Council. "We're getting away from the butt-in-chair syndrome and running businesses more like a college where employees work on a project basis." But companies like it, too. ▶



COBBLESTONES, THE Charles River, and Jimmy's Chowder King? This must be Boston, home to freelance writer Paul Wesel and hundreds of Internet-savvy start-ups.

TOP CENTER: KINDRA CLINEFF/TONY STONE; ALL OTHERS: SETH RESNICK; ICONS: TIM CARROLL

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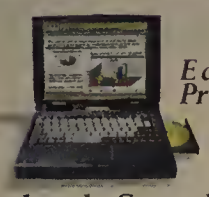

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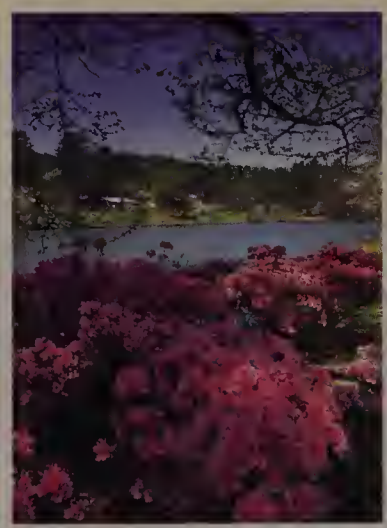
An employer can set up a worker at home for far less than it would cost to put that same worker in an expensive Orange County office. Those telecommuters can take advantage of the area's many Internet access numbers, and they can get all their computer supplies without straying too far from home.

With a low unemployment rate of 4 percent, Orange County will experience the biggest job boom of any of our Top 10 cities. That means more telecommuters to enjoy the area's beautiful weather. So when Grefe hears a child in the background during a phone interview with our reporter, he reflects the Orange County mind-set: "I'm really glad you're telecommuting. Now go back to your family."



FOR THE 1996 Olympics, Atlanta turned its workers into telecommuters —and brought home the gold. Technical writer Martha Cash enjoys having a job that lets her work almost anywhere.

Boston, Massachusetts

Within metro area: Cambridge, Gloucester
Three-bedroom house: $168,500
Projected job growth to 2001: 3.7 percent
Typical ISDN installation fee: $67
Basic rate for two phone lines: $26.83
Annual sunny days: 205

LOS ANGELES HAS the movies, but Boston has the brains. Its colleges and universities produce thousands of bright young people who form brash start-ups that often grow to great prominence in technology, finance, and medicine.

"You can drive in a straight line and hit 200 to 300 technology companies," says Paul Wesel, a freelance marketing communications writer who works for several Boston firms.

Many Beantown home workers once worked comfortably at large businesses; others, like Wesel, chose long ago to become self-employed. "New companies start up lean. And many old companies downsize," he says. "Either way, they outsource a lot of work."

For teleworkers, Boston is a major on-ramp to the Net, with a high concentration of local access numbers. Moreover, Nynex charges little to install ISDN lines in most locations.

When you're not thinking about work, you can ponder the birth of America at Boston's countless historical sites. For more recreational lounging, stop by Quincy Market or picnic along the Charles River. And if you catch a chill, don't worry: Boston has more than twice the national average of doctors per capita.

Atlanta, Georgia

Within metro area: Clayton County, DeKalb County, Fulton County
Three-bedroom house: $158,000
Projected job growth to 2001: 10 percent
Typical ISDN installation fee: $197.50
Basic rate for two phone lines: $34.90
Annual sunny days: 219

IF GONE WITH THE WIND didn't nail down Atlanta's celebrity status, the 1996 Olympics surely did. And oddly enough, the Olympics have a lot to do with Atlanta's bright telecommuting future.

Telecommuting accounted for a huge reduction in traffic and air pollution during the Centennial Games, says Michael Dziak, president of InteleWorks, a firm that helps employers establish telecommuting programs.

When it comes to a place for working at home, Atlanta is well worth considering. The job market is strong; you'll never have a problem finding an overnight courier; and most specialized phone services such as call waiting and call forwarding are free of start-up fees.

Martha Cash is a technical writer for ADP, a company that develops payroll processing software. She telecommutes several days a week, using a notebook PC to send e-mail and transfer files. Cash figures it buys her two hours a day.

"This is a great place to live," she says, "but the traffic gets more stressful every day. When I've got a deadline coming up, I usually work seven days a week, 10 or 12 hours a day, and I don't think I could do that unless I was telecommuting."

Nestled in the foothills of the southern Appalachians, Atlanta is a great place to live. It enjoys excellent job prospects, and it's one of the most multicultural cities in the world. And for telecommuting, Atlanta proudly carries the torch. ■

RIGHT: ANN STATES; ALL OTHERS: RON SHERMAN; ICONS: TIM CARROLL

What PC company in its right mind would risk running a Chat Room?

Maybe the only one with nothing to hide....

Our competition thinks we're nuts for running a chat room. After all, it gives our customers a chance to air the odd grievance. On the other hand, it also gives you the opportunity to hear a lot of the good things Quantex users say about us. All in all, we think that's a trade off. Because, unlike other PC companies, we want you to have every opportunity to find out what you're shelling out your hard earned bucks for before you buy, not when it's too late.

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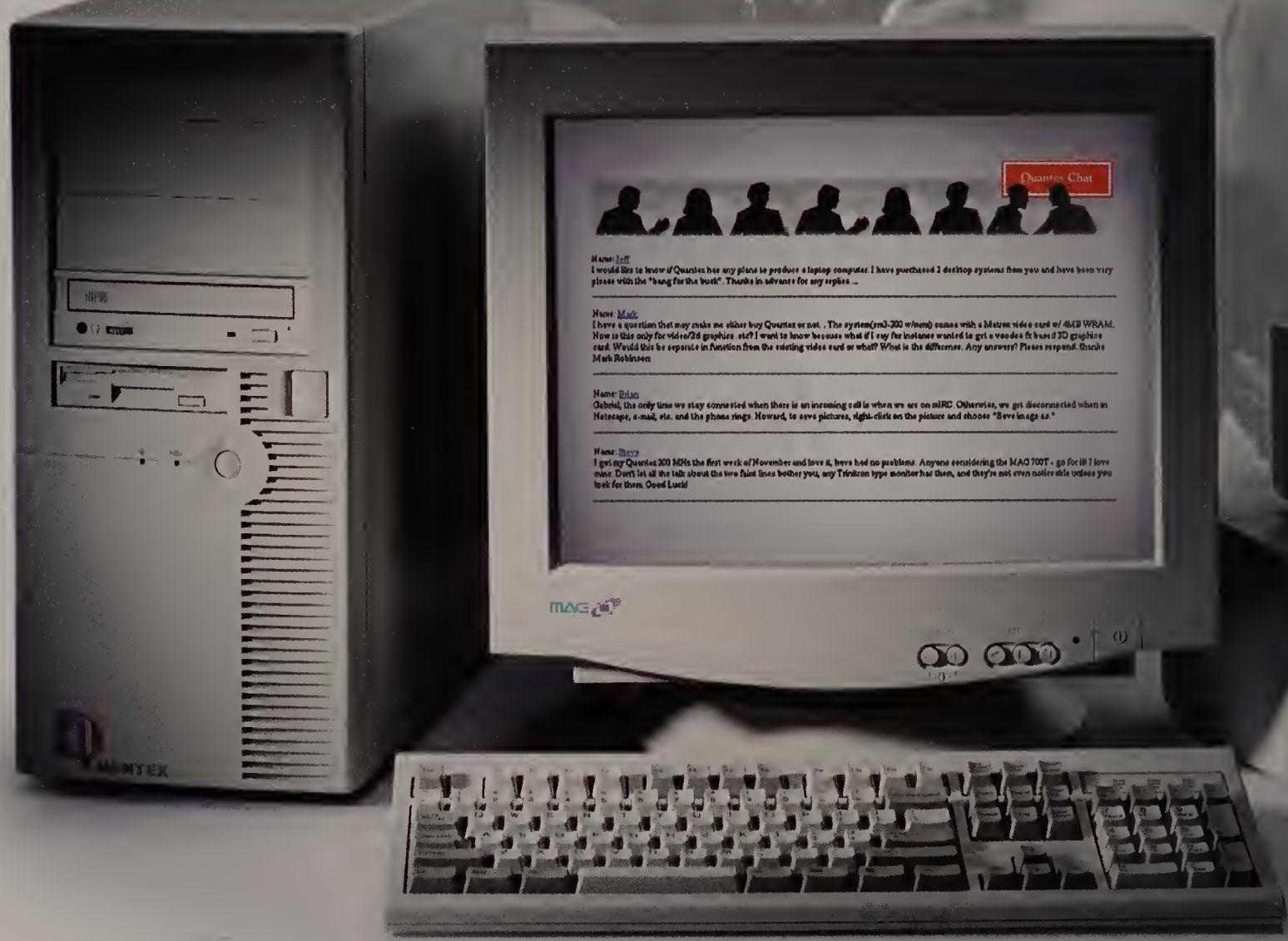

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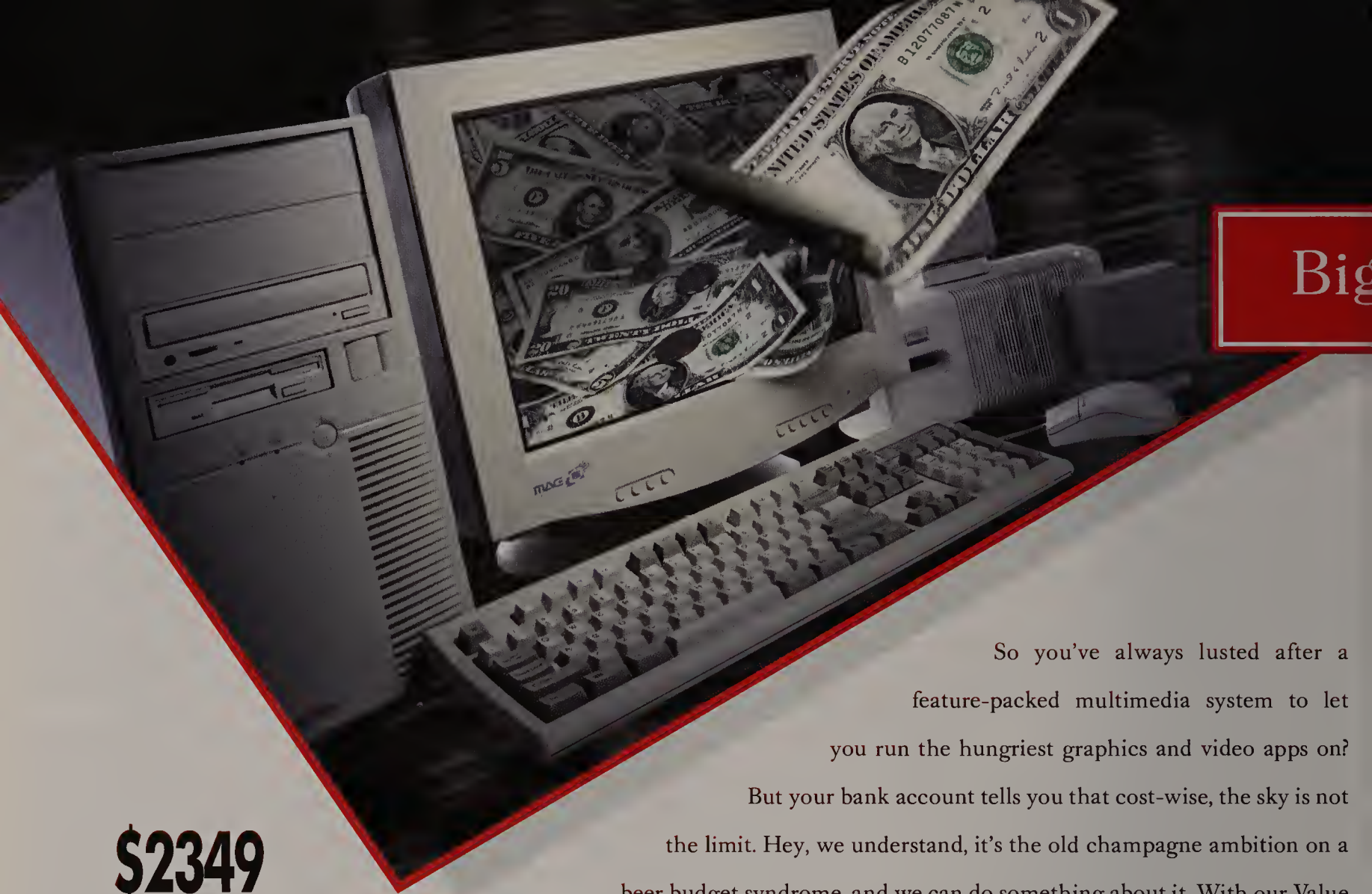

Big

So you've always lusted after a feature-packed multimedia system to let you run the hungriest graphics and video apps on? But your bank account tells you that cost-wise, the sky is not the limit. Hey, we understand, it's the old champagne ambition on a beer budget syndrome, and we can do something about it. With our Value Multimedia series, for less than you'd ever believe possible, we can give you an award-winning multimedia system that'll blow your socks off. And it'll keep doing it for years, long after some other, more expensive system has become a boat anchor.

$2349

QP5/200 M-4

Business lease: $ 82/month

- 200MHz Pentium Processor
- 32MB EDO Memory / 512KB Pipelined Burst Cache
  (Special Upgrade to 64MB EDO Memory - $199)
- 4GB EIDE Mode 4 Hard Drive
- 3.5" 1.44MB Floppy Drive
- Matrox Mystique 3D w/ 4MB SGRAM
  (Free 3D game included!)
- MAG 17" Digital Monitor (16.1" viewable)
- 33.6 Kbps Fax/Modem w/Voice Mail and Speakerphone
- Toshiba 12X 125ms EIDE CD-ROM Drive
  (Upgrade to the Panasonic PD Drive for $179)
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-45 Speakers w/subwoofer
- Mini-Tower Case
- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- 3-year limited Warranty, 24-hr./7-day Technical Support

QP5/133 M-4 ..... $1949
QP5/166 M-4 ..... $2149
QP5/200 M-4 (w/MMX Technology™) $2399

Introducing the first 32-bit sound card - only in Quantex systems!

Once again, Quantex takes a technology leap. Quantex systems now feature the newest sound card by Ensoniq™ - the Concert ES1370, the first 32-bit sound card to hit the market. It's a PCI device that takes full advantage of the fast transferring capabilities of the PCI bus. With 2MB of wavetable RAM standard (software upgradeable to 8MB) and the ability to utilize your system's hard drive to store additional samples, you can access over 4,000 unique sounds! Four-speaker output gives you the biggest and best sound you can get in any of today's multimedia PCs.

Did You Know ?

Quantex consistently offers award-winning PC solutions. In the past year or so, Quantex won 11 PC World Best Buy awards and has been on the PC World Top 20 List over 52 times!

ambitions on low budget?

The Best in 3D Graphics

With the Matrox Mystique®, the best in graphics and video are yours. Supporting full 2D and 3D acceleration for graphics-intensive applications and full Microsoft Windows 95® compatibility, it's no wonder it won an MVP award from PC Computing and a Best Buy award from PC World. See for yourself when you fire up the bundled software, like Psygnosis'™ Destruction Derby II (included FREE!).

Internet Connectivity, Free Web Page, And More

Quantex makes it easy to surf the Web with Epoch's Internet Service, the only Internet Service Provider with nationwide ISDN service. Send and receive Internet e-mail, surf the Web and much more. Put up your own home page using your free space on the World Wide Web. With Quantex, you can become part of the Internet, not just surf it!

- Corel WordPerfect Suite
- Corel Internet Mania
- Corel Print House
- Comptons Interactive Encyclopedia
- Comptons Reference Collection
- Comptons Zoo Explorer
- Quicken SE
- Modern Age Books Windows 95 Primer
- BodyWorks 5.0
- Key Master Maps
- Windows 95 with MS Plus
- Epoch Dial Internet Service
- Microsoft Phone 1.0 Telephony Software
- Mecklermedia's Official Internet World Yellow Pages
- One-month trial memberships to AOL, CompuServe and Prodigy

Did You Know?

- Quantex is recognized as a leader in performance and technology. Quantex has been on the cover of Computer Shopper 4 times since April, 1996 alone! (April, August and December, 1996 and March 1997)
- Quantex provides the best PC's for the small office/home office. Quantex was recently selected as *Home PC Magazine's Lab Winner* in the Home Office Category (December, 1996)
- Quantex PC's always offer top-notch performance and useability. Quantex has received PC Computing magazine's coveted "★★★★" 4-star rating 3 years in a row (1994, 1995, 1996)

Value Multimedia Series

QP5/133 M-1 $1399

Business lease: $49/mo.

- 133MHz Pentium Processor
- 16MB EDO Memory / 256KB Pipelined Burst Cache
- 1.6GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- 64-bit Virge 3D w/2MB EDO DRAM
- 15" Digital Monitor (14.0" viewable)
- 33.6 Kbps Fax/Modem w/Voice Mail and Speakerphone
- Toshiba 12X 125ms EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-40 Speakers
- Mini-Tower Case
- 104-Key Keyboard MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- 3-year limited Warranty, 24-hr./7-day Technical Support

QP5/150 M-1 ..... $1449
QP5/166 M-1 ..... $1599
QP5/166 M-1 (w/MMX™ Technology).. $1649

QP5/133 M-2 $1549

Business lease: $ 56/mo.

- 133MHz Pentium Processor
- 24MB EDO Memory / 512KB Pipelined Burst Cache
- 2.1GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Matrox Mystique 3D w/ 2MB SGRAM (Free 3D game included!)
- MAG 15" Digital Monitor (14.0" viewable)
- 33.6 Kbps Fax/Modem w/Voice Mail and Speakerphone
- Toshiba 12X 125ms EIDE CD-ROM Drive
  (Upgrade to Panasonic PD Drive for $179)
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-40 Speakers
- Mini-Tower Case
- 104-Key Keyboard MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- 3-year limited Warranty, 24-hr./7-day Technical Support

QP5/150 M-2 ..... $1599
QP5/166 M-2 ..... $1699
QP5/166 M-2 (w/MMX™ Technology).. $1749

QP5/166 M-3 $1949

Business lease: $ 68/mo.

- 166MHz Pentium Processor
- 32MB EDO Memory / 512KB Pipelined Burst Cache
- 2.5GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Matrox Mystique 3D w/ 2MB SGRAM (Free 3D game included!)
- MAG 17" Digital Monitor (16.1" viewable)
- 33.6 Kbps Fax/Modem w/Voice Mail and Speakerphone
- Toshiba 12X 125ms EIDE CD-ROM Drive
  (Upgrade to Panasonic PD Drive for $179)
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-40 Speakers
- Mini-Tower Case
- 104-Key Keyboard MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- 3-year limited Warranty, 24-hr./7-day Technical Support

QP5/133 M-3 ..... $1799
QP5/200 M-3 ..... $2149
QP5/200 M-3 (w/MMX™ Technology)..... $2199

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Power maniacs.
Your dream just came true.

This is it. The Quantex SM Power Multimedia Series powered by Intel's newest MMX™ technology. As one of the first companies to offer the full, awesome power of Intel's MMX™ technology, we guarantee you blazing speed and acceleration for all your communications, sound, 3-D modeling and multimedia applications. Expect your applications performance to increase up to 60% based on Intels Media Benchmark. Quantex systems powered by MMX™ technology have already received raves from the experts:

"(The Quantex QP5/200 SM-3) which earned this roundup's highest performance/features score, is an attractive choice for businesses." **PC Magazine, 2/4/97**

"Quantex QP5/200 SM-3 offers more than enough to keep any business desktop cranking out spreadsheets, or any home desktop burning through (games)." **Windows Sources, 2/97**

" ....It's a (workhorse) for almost any application".
Windows Magazine, 2/97

$2449

QP5/200 SM-3
(with MMX™ Technology)

Business lease:$ 85/month

- 200MHz Pentium Processor w/MMX™ Technology
- 32MB EDO Memory / 512KB Pipelined Burst Cache
- 4GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Matrox Millennium 3D w/4MB WRAM
- MAG 17" Digital Monitor (16.1" viewable)
  (Upgrade to MAG DX700T for $99)
- 33.6 Kbps Fax/Modem w/Voice Mail and Speakerphone
  (Add Motorola ISDN Terminal Adapter for $189)
- Toshiba 12X 125ms EIDE CD-ROM Drive
  (Upgrade to the Panasonic PD Drive for $179)
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-45 Speakers w/Subwoofer
  (Upgrade to Altec Lansing ACS-400 Speakers w/subwoofer for $99)
- Mid-Tower
  (Upgrade to APC Back-UPS Office for only $169)
- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- 3-year limited warranty, 24-hr./7-day Technical Support

QP5/166 SM-3(w/MMX™Technology).....$2249
QP6/200 SM-3(w/Pentium Pro processor) $2499

MMX™ intel inside pentium® PROCESSOR

Did You Know?

Quantex PC's consistently offer top-notch performance and usability.

Quantex has received PC Computing's coveted "★★★★" 4-star rating 3 years in a row! (1994, 1995, 1996)

Power Multimedia Series

Loaded and ready to light up.

Compromise is a word we refuse to recognize. That's why we use only the best components to get the best out of Intel's MMX™ technology. Like:

Intel's latest TX PCI chipset

Make your MMX™ instructions really fly. This new TX chipset supports all types of memory and Ultra DMA, giving you lightening-fast data transfer. Get the best possible performance out of your new Quantex (available on select Quantex SM systems).

32-bit PCI sound by Ensoniq™(A Quantex exclusive!)

This baby has 2MB of wavetable RAM standard (software upgradeable to 8MB), four-speaker output and the ability to utilize your system's hard drive to store additional samples. Access over 4,000 unique sounds.

Toshiba 12X CD-ROM

Twelve, that's right twelve times speed makes this the fastest CD-ROM drive you can get. With a 125ms access time and 1800KB/s transfer rate, there's no time for Jolt breaks here.

Matrox Millennium graphics

What the pro's swear by. And no wonder with an award winning 64-bit 3D graphics engine and Windows RAM (WRAM) for eyebrow singing performance.

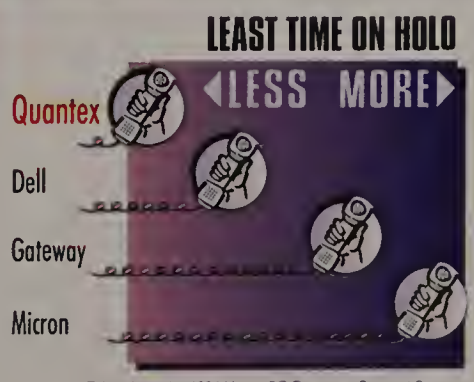
Plus. Corel's WordPerfect Suite 7, rated as the number 1 choice of office suites, two games enabled for MMX™ instructions (included with systems with MMX™ technology) and 20 other top titles and you've got yourself a packed software bundle. Top it off with Epoch's Internet Service that includes free space on the Web for your own killer home page.

Plus, Plus. The usual Quantex industrial strength 30-day, money back guarantee, and 7 days a week, 24 hour technical support.

Quantex Tech Support Won't Keep You Holding

Servicing your needs after the sale is our #1 priority. When you buy from Quantex, we take care of you.

Toll-Free Technical Support That Just Keeps Getting Better



Token from the 1996 Home PC Customer Support Survey

As a matter of fact, Home PC magazine (Nov. '96) readers rated us better than any of our competitors for *"Least Time On Hold"*. That's great should you ever need to call us.

Quantex - Working Hard For You

QP5/166 SM-1 (with MMX™ Technology) $1849

Business lease: $65/Mo.

- 166MHz Pentium Processor with MMX™ Technology
- 32MB EDD Memory / 512KB Pipelined Burst Cache
- 2.5GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Diamond Stealth 3D 2000 w/4MB EDD DRAM
- MAG 15" Digital Monitor (14.0" viewable)
- 33.6 Kbps Fax/Modem w/Voice Mail and Speakerphone
- Toshiba 12X 125ms EIDE CD-RDM Drive
  (Upgrade to the Panasonic PD Drive for $179)
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-40 Speakers
- Mid-Tower Case
  (Upgrade to APC Back-UPS Office for only $169)
- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- 3-year limited warranty, 24-hr./7-day Technical Support

QP5/200 SM-1 (w/MMX™ Technology).....$2049
QP6/200 SM-1 (w/Pentium Pro processor)....$2099

QP5/166 SM-2 (with MMX™ Technology) $2149

Business lease: $75/Mo.

- 166MHz Pentium Processor with MMX™ Technology
- 32MB EDD Memory / 512KB Pipelined Burst Cache
- 3.2GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- STB Velocity 3D w/4MB VRAM
- MAG 17" Digital Monitor (16.1" viewable)
- 33.6 Kbps Fax/Modem w/Voice Mail and Speakerphone
  (Add Motorola ISDN Terminal Adapter for $189)
- Toshiba 12X 125ms EIDE CD-RDM Drive
  (Upgrade to the Panasonic PD Drive for $179)
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-45 Speakers w/subwoofer
- Mid-Tower Case
  (Upgrade to APC Back-UPS Office for only $169)
- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- 3-year limited warranty, 24-hr./7-day Technical Support

QP5/200 SM-2 (w/MMX™ Technology).....$2349
QP6/200 SM-2 (w/Pentium Pro processor)...$2399

QP6/200 SM-4 $2699

Business lease: $94/Mo.

- 200MHz Pentium Pro Processor
- 64MB EDD Memory / 256KB Internal L2 Cache
- 4GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Matrox Millennium 3D w/4MB WRAM
- MAG 17" Digital Monitor (16.1" viewable)
- 33.6 Kbps Fax/Modem w/Voice Mail and Speakerphone
  (Add Motorola ISDN Terminal Adaptar for $189)
- Toshiba 12X 125ms EIDE CD-RDM Drive
  (Upgrade to the Panasonic PD Drive for $179)
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-400 Speakers w/ACS-250 subwoofer
- ATX Case
  (Upgrade to APC Back-UPS Office for only $169)
- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- 3-year limited warranty, 24-hr./7-day Technical Support

QP5/166 SM-4 (w/MMX™ Technology) $2499
QP5/200 SM-4 (w/MMX™ Technology) $2649

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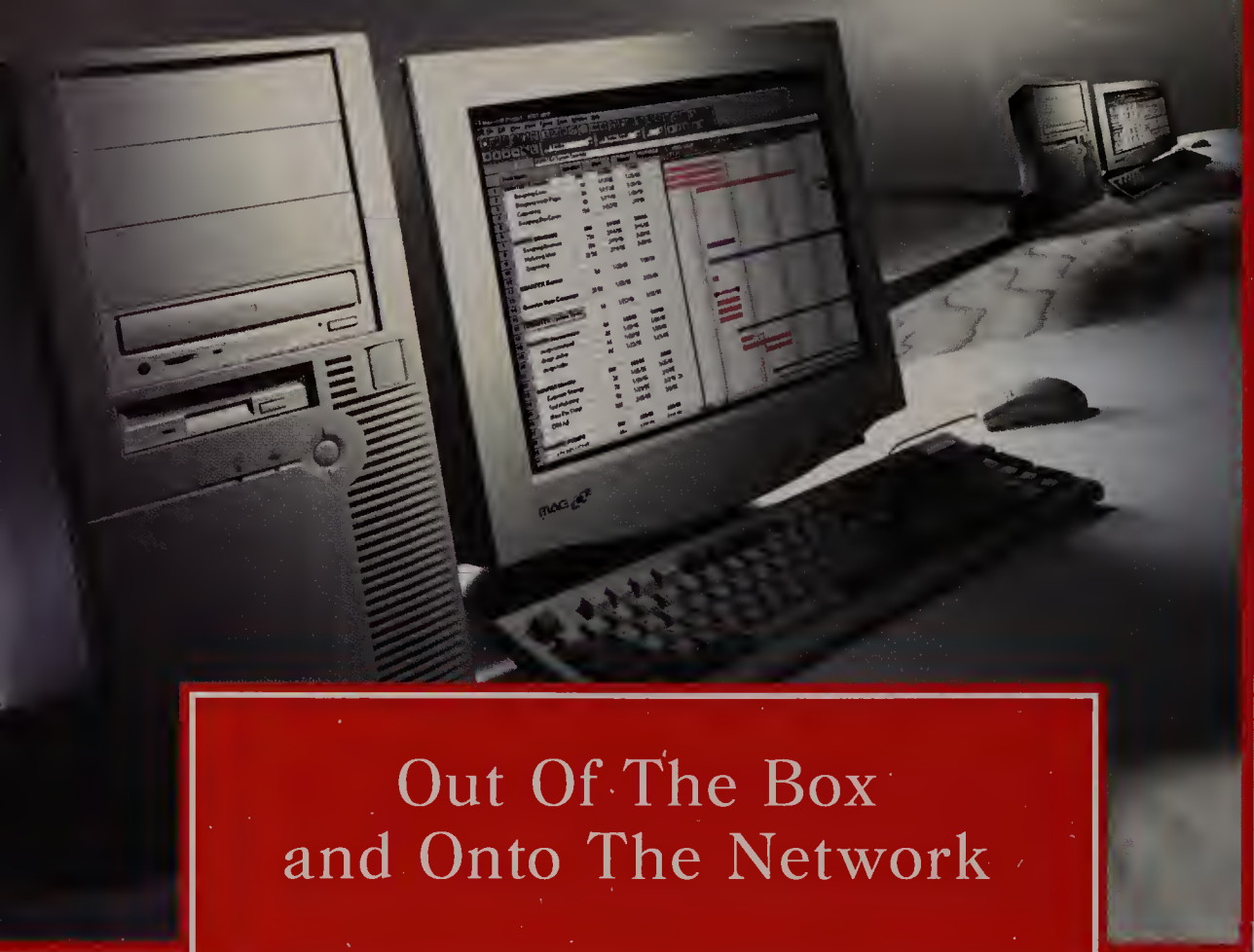

Out Of The Box and Onto The Network

If you need the best performing systems for high-end graphics, network or Web server functions, Quantex has the systems that you've been waiting for. And with 3Com network-ready certification, you're assured painless network integration and compatibility.

$1249 Business lease: $44/Mo.

QP5/120 WS-1

- 120MHz Pentium Processor
- 16MB EDO Memory / 256KB Pipelined Burst Cache
- 1.2GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- STB 64-bit Virge 3D w/ 2MB EDO DRAM
- 15" Digital Monitor (14.0" viewable)
- 3Com 3c509 ISA Combo NIC
- Toshiba 12X 125ms EIDE CD-ROM Drive
- Mini-Tower Case
- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows '95 With MS Plus
- 3-year limited Warranty, 24-hr./7-day Tech Support

QP5/133 WS-1 .....$1299
QP5/166 WS-1 .....$1449
QP5/166 WS-1 (w/MMX™ Technology)...$1499

$2499 Business lease: $87/Mo.

QP6/200 WS-3

- 200MHz Pentium Pro Processor
- 32MB EDO Memory / 256KB Internal L2 Cache
- 4GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Matrox Millennium 3D w/2MB WRAM
- MAG 17" Digital Monitor (16.1" viewable)
- 3COM 3c905 PCI 10/100 NIC
- Toshiba 12X 125ms EIDE CD-ROM Drive
- ATX Case

(Upgrade to APC Back-UPS Pro 650 for only $285)

- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows NT 4.0 Workstation
- 3-year limited Warranty, 24-hr./7-day Tech Support

QP6/180 WS-3 .....$2399

Quantex VideoPhone System

Video and voice over a single, plain old telephone wire? Yes. And from Quantex, of course.

$1949 Business lease: $ 68/mo.

QP5/166 VM-1

- 166MHz Pentium Processor
- 16MB EDO Memory / 512KB Pipelined Burst Cache
- 2.1GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Diamond Stealth 3D 2000 w/ 4MB EDO DRAM
- MAG 15" Digital Monitor (14.0" viewable)
- Intel DSVD 28.8 Fax/Modem
- Toshiba 12X 125ms EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Soundcard
- Altec Lansing ACS-45 Speakers w/subwoofer
- Mid-Tower Case
- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows '95 With MS Plus
- Quantex Software Bundle (Including Corel WordPerfect Suite)
- Special VideoPhone and Intercast Bundle
- VideoPhone Camera
- Intel Video Capture Card w/TV Tuner
- 3-year limited Warranty, 24-hr. / 7-day Technical Support

QP5/200 VM-1 .....$2149

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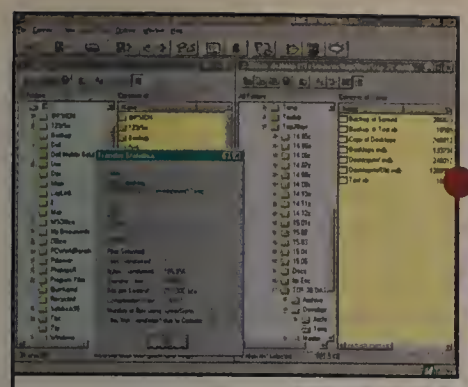
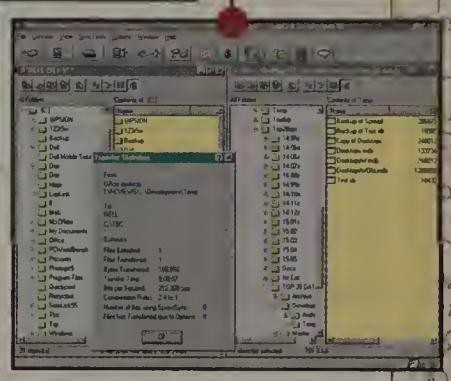


BILL CARTER, an investment manager in San Diego, uses LapLink to keep productive at home, the office, and everywhere in between.



Remote Control

If You Had This Software, You'd Be Home By Now

Want to work from home? You'd better be well connected. PC World's McCracken cracked the shrink-wrap on eight remote access packages. Two did the job.

By Harry McCracken

WHAT MAKES FOR successful telecommuting? It helps to a have a flexible boss who's confident that you really *are* working at home, and not communing with Oprah. It's also important to have a relatively quiet and comfortable place to work, even if it's a corner of the laundry room. And you need to make sure you're not out of touch just because you're out of the office.

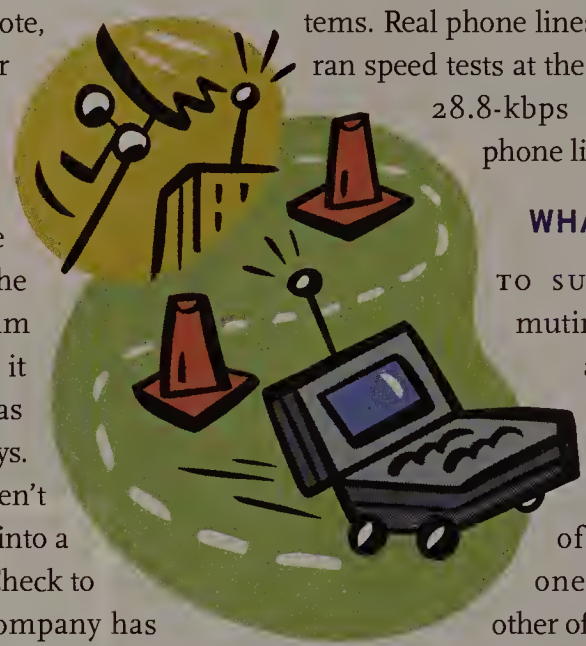
That's where remote access software comes in. If you equip your home PC with the right package, it's simpler than ever to get at files, programs, and networked resources back at the office—whether you're telecommuting full-time or part-time, or just at home for the day to nurture a sick child. And remote access software ▶

installed on a notebook PC is invaluable when your job takes you to a branch office or a client's workplace.

Remote access software has been around for a long time, but the newest Windows 95–compatible packages have made inroads in usability, features, and versatility. Of the eight I tested, two were Best Buys: Microcom's Carbon Copy 32 4.0 and Traveling Software's LapLink for Windows 95 7.5. A new product, Quarterdeck's Rapid Remote, wasn't available for testing, but it looks like a potential Best Buy. It's based on the excellent remote access features of the company's Procomm Plus 95; and at $69, it costs less than *half* as much as our Best Buys.

These products aren't the only ways to tap into a computer at work. Check to see whether your company has remote node access, which lets multiple workers dial in to the corporate local area network via analog or ISDN modem. Remote node access is appealing if your company has several telecommuters: Everyone shares a central access point, so it's more economical over the long run, and easier for the information systems staff to monitor for intruders. But remote node access isn't designed for a single user; it relies on server software or LAN hardware that must be set up by an expert, and the initial cost can be thousands of dollars.

We tested the packages both as a telecommuter might use them and at the PC World Test Center. I used each program to work from my own home office, shuttling files back and forth, working with apps installed on the office PC, and using the office e-mail and group scheduler systems. Real phone lines are erratic, so we ran speed tests at the Test Center, using 28.8-kbps modems and a phone line simulator.



WHAT YOU NEED

TO SUPPORT telecommuting, all the remote access packages we review here require that you have a PC at the office and another one at your home or other off-site location. You also need a way to get the two PCs talking with each other (see "Making the Connection" for your options, which include analog and ISDN modems and the Internet).

I encountered major installation problems only with Close-Up 6.5 and CoSession Remote 7.0, two packages that run under Win 95 but are built around DOS and Windows 3.1 technology. All the other packages were native Win 95 apps. Thanks to TAPI—Win 95's modem configuration system—they instantly knew about the modems that were attached to my PCs. Although remote access software has had a reputation for monkeying with a PC's setup, the Win 95 programs were there when I needed them and kept out of the way the rest of the time.

If you and your office both use Windows 95, you'll be happiest with a true Win 95 package. But what if you've moved to the new operating system while your company is sticking with Win 3.1, or vice versa? All the native Win 95 apps except Procomm are options because they can work with a Win 3.*x* version of the software. LapLink and ReachOut include a Win 3.1 version; Carbon Copy, pcAnywhere32, and Remotely Possible/32 offer Win 3.1 software as a separate, extra-cost package. These are all older versions that don't support the new features and performance tweaks of the Win 95 editions. Carbon Copy, pcAnywhere, and Remotely Possible work under Windows NT as well as Win 95; NT versions of the others are in the works.

CHOOSE YOUR TOOL

NO MATTER WHICH package you pick, you'll get two major remote access options: file transfer and remote control. Each approach handles some types of long-distance work reasonably well and others poorly or not at all.

ILLUSTRATION: TIM CARROLL

FEATURES COMPARISON

REMOTE ACCESS SOFTWARE	STANDARD FEATURES: Street price [1]	Hard disk space required (MB)	Platforms supported	TAPI compliant	Analog, ISDN support	Internet (TCP/IP)/ other networks	Direct cable/cable included
Carbon Copy 32 4.0*	$149	4	Win 95, Win NT, Win 3.1 [2], DOS [2]	●	●	●/NetWare	●/●
Close-Up 6.5	$199	2.8	Win 95, Win 3.*x*, DOS	○	●	○/○ [3]	●/○
CoSession Remote 7.0	$79	5.5	Win 95, Win 3.1, DOS	○	●	●/NetBIOS, NetWare	●/○
LapLink for Windows 95 7.5*	$149	7	Win 95, Win 3.1, DOS	●	●	●/NetWare	●/●
pcAnywhere32 7.5	$149	16	Win 95, Win NT, Win 3.1 [2], DOS [2]	●	●	●/Banyan, NetBIOS, NetWare	●/●
Procomm Plus 95 4.0	$139	13 [5]	Win 95	●	●	●/○	●/○
ReachOut 6.0	$139	6	Win 95, Win 3.1, DOS	●	●	●/NetBEUI, NetWare	●/○
Remotely Possible/32 3.0	$169 [6]	2	Win 95, Win NT, Win 3.1 [2]	●	●	●/NetBIOS, NetWare	●/○

*Best Buy ● Yes ○ No

[1] Licenses for two PCs.

[2] Supported through separate, extra-cost version that can connect with version reviewed.

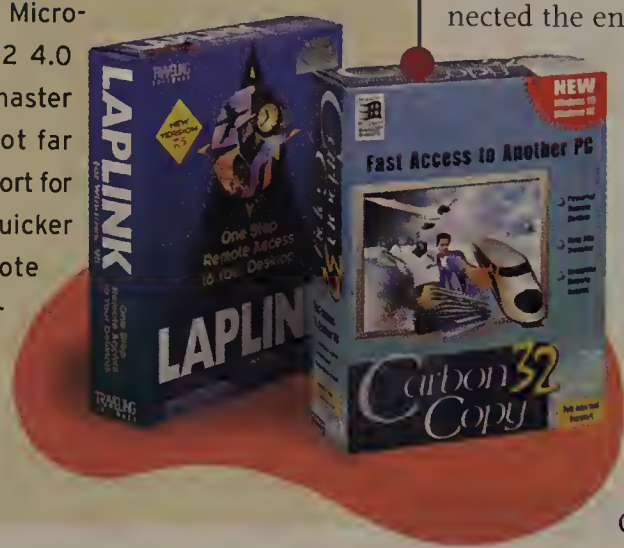
[3] $399 Close-Up/LAN Pro supports connections over NetWare.

[4] Maximum supported by PC.

Best Buys

Carbon Copy 32 4.0 and LapLink for Windows 95 7.5

NO WONDER there are so many remote access packages on the market: No single product offers a blend of power, usability, and speed that's guaranteed to make every user happy. On balance, though, two products stand out from the crowd. Traveling Software's LapLink for Windows 95 7.5 gets the nod for its well-thought-out interface and on-screen help, top-notch file transfers, and its support for both Windows 95 and Win 3.1 in one box. Microcom's Carbon Copy 32 4.0 isn't quite as easy to master as LapLink, but it's not far behind, and it adds support for Windows NT 4.0. It's quicker than LapLink for remote control, and it can reroute printer output from the office to your off-site computer, which LapLink can't do.



But remote control has limitations, too. Sending the office PC's display across the remote link and replicating it on the off-site PC is slow, no matter how fast the two systems are. And you must be connected the entire time you're using remote control, which can be costly if it's a toll call or impossible if you're not near a phone line or other means of connection.

File transfer provides a file manager that shows all the drives attached to both PCs. You copy data files from the office to your off-site system, disconnect the remote link, and then use them with apps installed on the off-site PC. When you're done, you copy the updated files back to the office. These file transfer features usually offer synchronization options to help ensure that the files on both PCs reflect your recent changes, so you always work with up-to-date files. To cut down transfer times, most programs use compression techniques such as comparing the versions of a file on both ends and transmitting only the differences.

File transfer works well with small data files; but you don't want to copy an entire 50MB database over a 28.8-kbps modem line just to look up a single record. Or what if you need to work with a file that was created using software that's not installed on your off-site PC at all?

In these situations, you need remote control. When you launch a remote control session on your off-site PC, your office system's desktop appears on the off-site PC. You can run the office system's apps, load its data files, and do almost anything that you could if you were in the office. The only data sent across the link are the office PC's display information and your keyboard and mouse input on the off-site system. The actual data files don't leave the office, so it's as easy to work with mammoth files as small ones.

TESTING PERFORMANCE

TO TEST these remote access packages' speed at the PC World Test Center, we performed tasks in four typical business applications: Microsoft Word 95, Excel 95, Micrografx's Picture Publisher 6.0 image editor, and Lotus's Organizer 2.1 personal information manager. As the Test Report shows, nearly every product did well in some tests and poorly in others. Overall, LapLink was fastest for file transfer, and pcAnywhere32 was quickest for remote control. (The latter product's approach to screen refreshing can temporarily garble the display, however; see its review for details.) Procomm Plus was also impressive: It was in the top three for both file transfer and remote control.

The chart also shows how remote control and file transfer compare in speed. With most of the programs, it was ▶

				SECURITY			SUPPORT				
Infrared	Maximum colors	Maximum resolution	Remote printing	Multiple user accounts and passwords	Encryption	Virus checking	Free support (days)	Weekday support (hours)	Weekend support	Toll-free support	Fax/online support
●	16.8M	1280 by 1024	●	●	●	●	unlimited	11	○	○	●/●
○	16	800 by 600	●	●	○	○	unlimited	10	○	○	●/●
○	16.8M	1280 by 1024	●	●	●	○	unlimited	8	○	○	●/●
●	16.8M	[4]	○	●	●	○	90	9	○	○	●/●
●	16.8M	[4]	●	●	●	●	90	9	○	○	●/●
○	256	[4]	●	●	●	○	90	9	○	○	●/●
○	65,536	2048 by 2048	●	●	●	●	60	9	○	○	○/●
○	16.8M	[4]	●	●	●	○	60	10	○	○	●/●

[3] For remote features only; full installation requires 45MB.
[4] Windows 95-only version; Windows 95/Windows NT version $199.

faster to transfer Word and Excel files to the off-site PC and work with local copies of the applications. But with Organizer and Picture Publisher files it was always more efficient to work by remote control.

The Test Center also ran file transfer tests on another remote access method: Remote Access Server, included in Microsoft's Plus package of Win 95 add-ons. With RAS running on the office PC, and Win 95's Dial-Up Networking set up on the off-site PC, you can dial in to your office system and transfer files without using a separate remote access package.

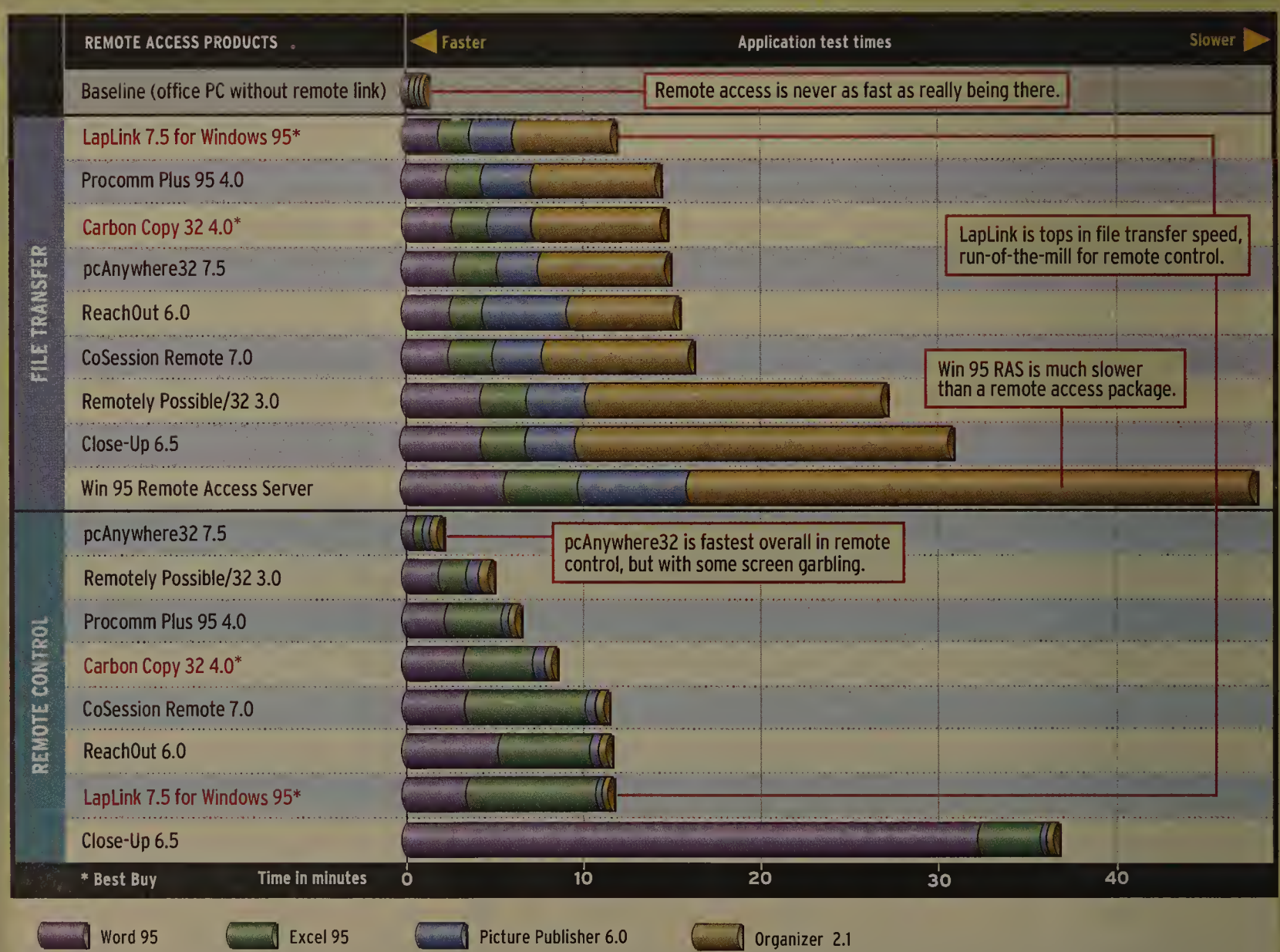
You probably don't want to, though. In the first place, set-up is tricky: You install different bits of software on the office and off-site PCs, following instructions that assume you're familiar with networking lingo. RAS has no built-in remote control, and it usually lagged far behind the stand-alone remote access packages in speed. For example, transferring the 3.9MB Organizer address book took 6 minutes with LapLink (the fastest remote access package in that test) and about 33 minutes with RAS. The problem may be that RAS is poorly suited to running on a garden-variety PC. Microsoft contends that it performs well as a multiuser remote access solution when run on an NT PC with 64MB of RAM. But you've got to wonder why it's on the Plus CD alongside items that require neither a high-end computer nor much technical knowledge.

SEEKING SUPPORT

Though remote access is getting easier, you may still need expert help. Unfortunately, support policies for the products reviewed here aren't generous. Carbon Copy, Close-Up, and CoSession are the only ones with unlimited free (but not toll-free) phone help rather than just 60 or 90 days. All eight vendors make you pay for the cost of the call. And if you keep odd work hours, note that none of the standard plans let you talk to a real person late at night or on weekends. ▶

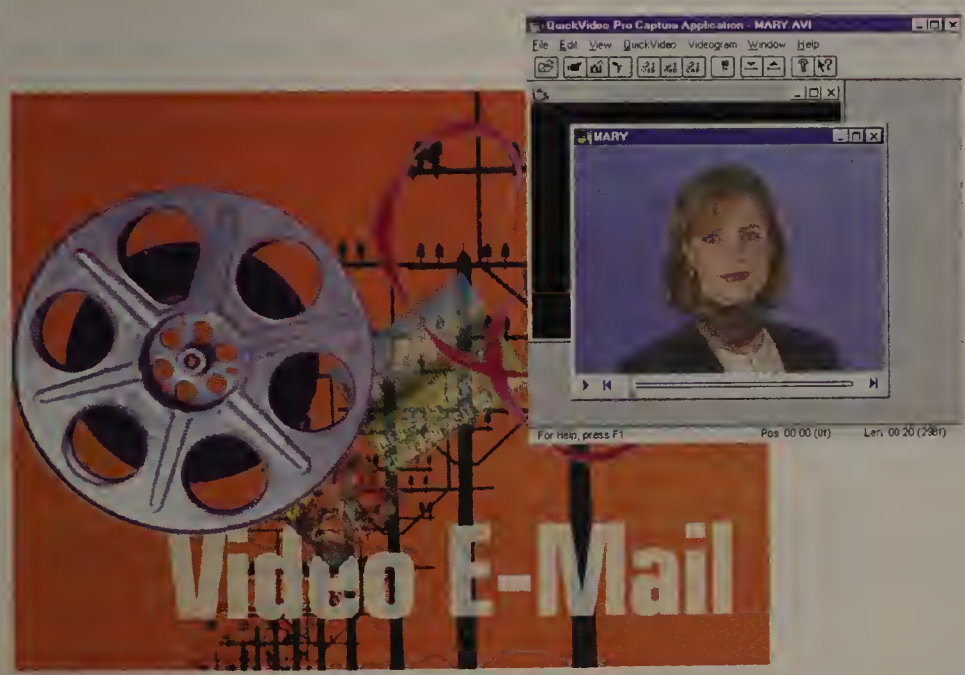
TEST REPORT

LapLink Speeds Transfers; pcAnywhere32's Remote Control Is Fastest

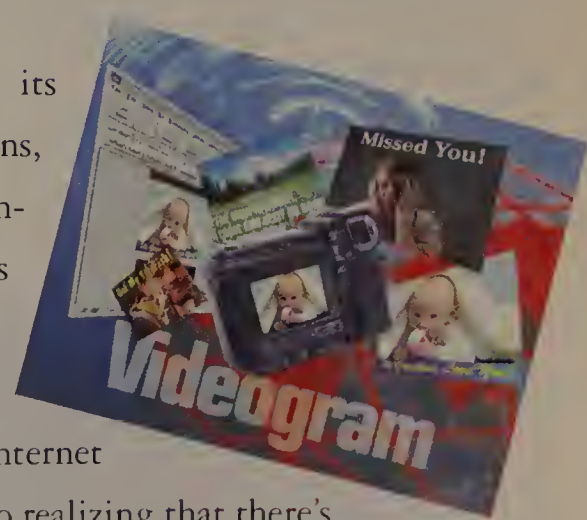


HOW WE TEST We tested remote access performance under Windows 95 using a Hewlett-Packard Vectra VL/4 133-MHz Pentium PC with 16MB of RAM as the office PC and a Micron Millennia 90-MHz Pentium PC with 16MB of RAM as the off-site PC. Both systems had Motorola ModemSurfr 28.8-kbps modems and graphics cards that used S3 Trio/864 processors; drivers were set to 800 by 600 resolution with 256 colors. For file transfer tests, we copied data files from the office PC to the home PC, disconnected the remote access connection, performed the tests for each application on the home system, then copied the files back to the office system. For remote control tests, we launched a remote control session of the office PC from the home PC, then performed the tests for each application remotely. Word 95 tasks included opening, viewing, editing, and saving a 630K document. Excel 95 tasks included opening, editing, charting, and saving a 155K spreadsheet. Picture Publisher 6.0 tasks included opening, applying special effects to, and saving one image in a group of seven JPEG images totaling 473K in size.

Videogram technology puts people face to face via their PCs.



High-quality, low-cost desktop video is now as simple as sending e-mail.



Today's networked world, with its instant, pervasive communications, is making for a business environment that moves faster and is more fiercely competitive than ever before. And while many businesses are utilizing multimedia, e-mail, and the Internet to a competitive advantage, they are also realizing that there's a competitive downside to our increasingly wired environment: Information overload is making it harder than ever to stand out and be noticed, while the hectic pace of business calls for ever-faster response times. As a solution, more and more businesses are innovating with video to get the attention

BY GARY FRANK

DESIGN: ELAINE KWONG

of clients and customers—fast.

To fortify customer relationships, introduce client service team members, make sales presentations and product launches more memorable, add impact to Web sites, or just gain valuable "face time," many businesses are discovering the benefits of using their PCs to communicate with video. And as they do, they are finding a time- and money-saving alternative to face-to-face meetings that also adds a touch of humanity to a world dominated by impersonal voice mail and e-mail.

A simple desktop video solution

Luckily, there's a new technology that makes it all simple. With Alaris QuickVideo™, PC users can import AVI files or capture sound, images, and video from any source—camcorders, TVs, or VCRs. What's more, Macromedia

Director or Adobe Premiere files that have been saved as AVI files can also be used as source material. Then, with Alaris' Videogram™ software, users quickly can create a super-compressed, ready-to-deliver video file. Videogram's proprietary compression algorithm takes an AVI file for a 60-second video clip that might range up to 30MB and compresses it down to less than 1MB. As a result, a Videogram file can be up to 5 times smaller than a comparable MPEG file. All of which means it can be uploaded and downloaded fast, and is small enough to distribute by attaching it to e-mail or putting it on a standard 1.4MB floppy disk—instead of a CD-ROM or Zip drive. A playback utility is automatically embedded, so recipients can play the file without any special hardware or software, just by clicking on the Videogram icon. All that's needed is a 486 or faster Windows PC, and a sound card and speakers to hear audio.

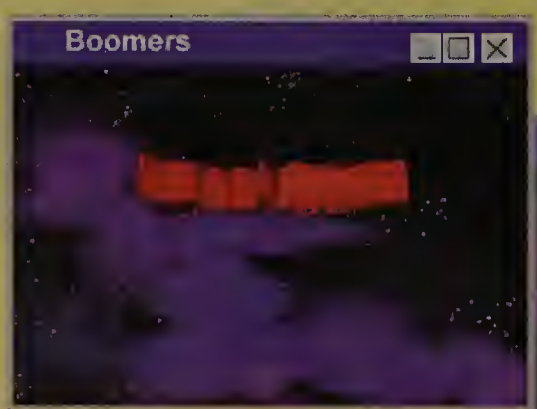
An affordable sales, service, and training tool—ready for just about any Windows PC

Videograms are gaining broad popularity. From on-line training sessions on corporate intranets and realtors giving prospective home buyers e-mail tours, to clips of the new baby sent to grandma, this inexpensive video solution is

Video production firm saves time, cuts costs with Videograms.

NET Multimedia develops content—everything from traditional TV commercials and product demo videos to CD-ROM animations and Web sites—for a variety of clients in the traffic-clogged Houston-metro area. With Videograms and a Pentium 133 system, INET is finding an efficient, easy-to-use timesaver. "We used to spend a good part of our work week stuck in traffic, heading to clients to get feedback on projects," said Robert Jacobs, director of video production at INET. "Now, we just e-mail a Videogram for rough off-line approvals. It saves us a tremendous amount of downtime and courier costs," he added.

Since INET downloads video direct from a betacam deck to an AVI file, the Videograms it produces are of exceptionally high quality. "The Videograms give our clients a very good idea of what the finished product will look like, even when we bump up the screen size beyond 320 x 240 pixels. We use them to make interim edits and revisions, and now only have to show up in person when it's time to sign off on the final cut," noted Jacobs.



With Videograms, INET clients can preview work-in-progress with ease and convenience.

Memorable marketing with Videograms.

Leave it to multimedia experts to figure out innovative ways to use Videograms to connect with their customers. At a recent trade show, instead of hauling around company brochures with business cards, INET came armed with promotional Videograms on floppies. "It sure got their attention. They could pop in the floppy, click on the Videogram icon, and instantly see what we're all about," said Jacobs. "People pick up all sorts of literature at trade shows and then trash it in the hotel room. Our Videogram made it back to their offices."

Save time with smaller files.

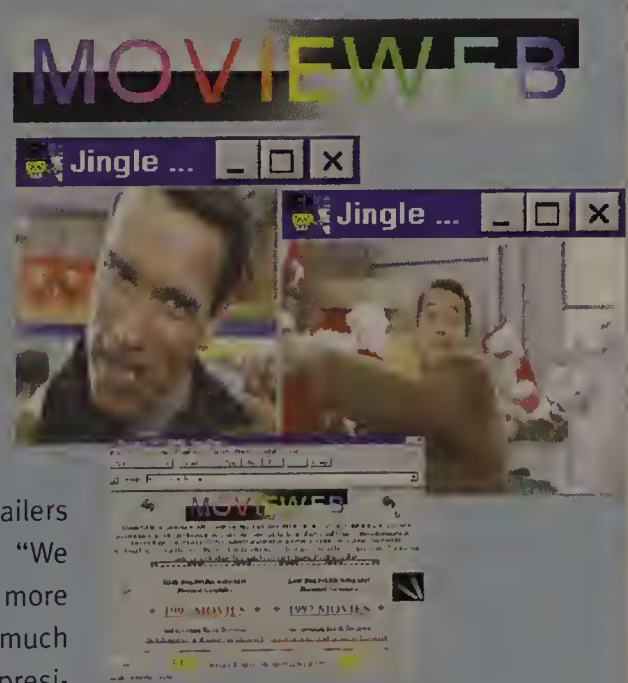
The smaller the file, the quicker the upload (and download). Here are some tips on creating files that won't keep you—or the recipients of your Videograms—waiting long:

- Less motion makes for smaller files; to obtain more static images use a tripod with the camera
- A clear audio track provides better sound and creates a smaller file; for a clean track use a separate microphone
- Zooms, fades, dissolves, and other transitions increase file size
- Animations eat less bytes than video
- A still image with voice over can often communicate as much information as a full-motion video; this technique yields a very small Videogram file

showing up in a growing number of business and personal applications. The standard system including software and an easy-to-install capture board starts under $300, with camera, microphone, and CU-SeeMe videoconferencing software available as options. A souped-up QuickVideo Pro System offers advanced editing options, allowing users to combine multiple clips with different playback resolutions, as well as adjust the file size—hence the quality—of their Videograms. Any 486DX2/66 and up PC running Windows 95 or 3.1x with 8MB RAM and 20MB free disk space can create and play Videograms. The recommended configuration calls for a Pentium PC with 16MB RAM and a 1GB hard drive. (Before being compressed by the Videogram software, AVI files take up plenty of space—so the more free disk space, the better).

Now playing at a PC near you.

Movieweb, a virtual Hollywood on the World Wide Web (http://movieweb.com), provides Netizens with everything they could possible want to know about the movies: film reviews, publicity shots, celebrity lore, links to the home pages of studios and stars, and trailers of selected new releases. When Movieweb first started, the service used QuickTime and Video for Windows for posting trailers to its site. Now, with Videograms "We get the same or better video quality, more fps (frames per second), and a much smaller file size," said Dave Riess, president of the Los Angeles company. "That saves us a lot of bandwidth and storage," he added.



Self-playing Videograms give Movieweb visitors instant access to Hollywood's latest releases.

The small, self-playing Videogram files make it fast and easy for Movieweb visitors to download and view trailers. "The capture and conversion are quite good," Riess noted. "The quality of the downloaded video files is excellent, especially when viewed at 160 x 120 pixels," he concluded.

DV AWARD OF EXCELLENCE

Put A Face With That Name

The fastest and easiest way to get video in and out of your computer is QuickVideo and QuickVideo Pro from Alaris. It's the easiest way to put a face to your e-mail.

You can capture video, audio, and still images from any video source. Then you can send them out by e-mail using Alaris' Videogram technology. You can easily compress a minute of audio and video into a file that's less than 1MB—so small it hardly takes anytime to up- and download by e-mail.

DV Magazine said the QuickVideo Pro "is very slick and easy to use." Bill Machrone of PC Magazine said, "Now I'm itching to send Videograms to friends and associates."

If you want to see what everyone is raving about, get a QuickVideo or QuickVideo Pro. And start putting a face to your e-mail.

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for more information or the dealer nearest you.

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CARBON COPY 32 4.0

PRO: Easy to configure and use; includes cable for direct connections; unlimited free phone support.

CON: Slow remote control with Picture Publisher.

Microcom took its time moving Carbon Copy to Windows 95—Carbon Copy 32 4.0 hit the market just in time for this review—but it was worth the wait. The first Windows 95 version of Carbon Copy is a well-rounded $149 package that's easy to learn and use, and delivers above-average performance. That makes it a Best Buy, along with LapLink. Carbon Copy's interface is full of helpful touches, including an array of wizards second only to those in Procomm Plus for setting up your office and off-site PCs. I especially liked the package's approach to error messages: When it couldn't complete an action, it clearly explained what was wrong, and then supplied the dialog box needed to correct it.

CARBON COPY'S REMOTE CONTROL lets you switch rapidly between full-screen and windowed views, using a handy icon panel (upper right-hand corner of window).

Remote control with Carbon Copy was 38 percent faster overall than with LapLink, even though Carbon Copy finished dead last in the Picture Publisher tests. It also has a superior system for toggling between a full-screen remote control session and a windowed view that lets you easily jump back to the local desktop: It uses an on-screen icon instead of a cryptic keyboard command such as LapLink's <Ctrl>-<Shift>-F. Microcom's Web site even offers a free Netscape Navigator plug-in and Internet Explorer ActiveX control for remotely controlling a distant PC over the Internet from within your Web browser. However, these applets are 16-bit programs that lack many of the full packages' notable features.

Carbon Copy's file transfer features are more than adequate, but LapLink keeps an edge here, with faster performance and a simpler approach to synchronization. The two Best Buys have differing platform support, too: Carbon Copy ▶

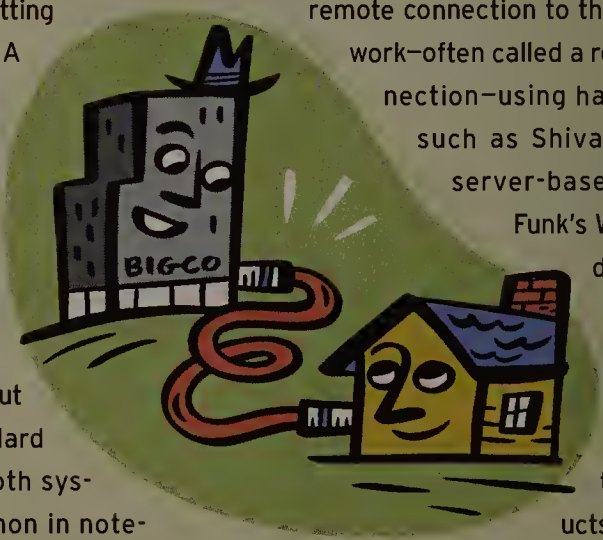
Making the Connection

TODAY'S REMOTE ACCESS programs offer more ways than ever to get two PCs talking to each other. Here's an overview of common connection methods; you may find yourself mixing and matching several of them to handle different tasks. Check the Features Comparison chart to see which products support which connection types.

Analog or ISDN modem: The traditional way to get two PCs talking to each other via remote access is to use modems on both ends. If at all possible, use at least 28.8-kbps modems. Using the same model on both ends can help prevent faulty connections and ensure that you get the best compression. ISDN modems, though costlier and often painful to configure, are much faster—up to 128 kbps. Either option works well, assuming you can convince your company to give you your own modem and data line (see centralized remote access, below).

Internet: If your office PC has a full-time Internet connection such as a T1 line, and if your off-site system has a dial-up account with an Internet service provider, you can use the Net as your remote access pipeline. Remote access packages handle this by using the TCP/IP network protocol, just as Web browsers do. The biggest advantage of using the Internet is that if your ISP's access number is a local call you can connect from anywhere in the world without paying long-distance phone rates. The downside is that Internet data transfer can be choppy and unpredictable, as every Web surfer knows.

Direct cable/infrared: These two options are handy for moving files between two computers that are sitting in the same room. A direct cable connection joins the systems with a cable that plugs into their parallel or serial ports. A wireless infrared connection is more convenient, but you need IrDa-standard infrared ports on both systems (they're common in notebooks, rare in desktops). Despite the IrDa standard, infrared connections are most likely to work correctly if the two PCs are made by the same manufacturer.



Local area network: Support for network protocols such as NetWare's IPX permits a remote access package to run over a local area network, so one user can control the PC of another employee. This lets IS staffers control distant PCs to check configurations and solve problems without running around. It can also be useful for collaboration, because it allows you and a coworker to go over, say, an on-screen spreadsheet without leaving your offices.

Centralized remote access: Many companies with multiple telecommuting employees provide a shared, centralized remote connection to the local area network—often called a remote node connection—using hardware devices such as Shiva's LanRover or server-based software like Funk's WanderLink. Products like these cost anywhere from $500 to thousands of dollars. In addition, the products are meant to be installed and maintained by IS experts, not end users. However, because they're meant to be shared, they can be more cost effective and less suspectible to security breaches than individual modems and phone lines. Some come with remote control as a standard feature; others work with the packages reviewed here.

ILLUSTRATION: TIM CARROLL

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PHILIPS MAGNAVOX

PC MAGAZINE EDITOR'S CHOICE

BYTE BEST OF COMDEX FALL '96

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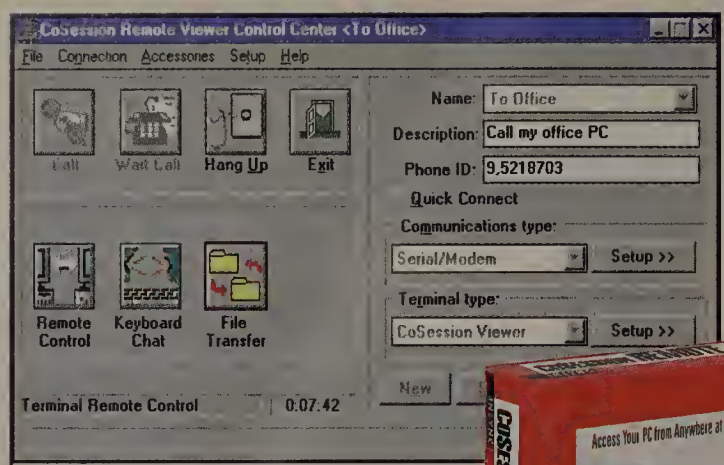

COSESSION REMOTE IS CHEAP and fairly powerful, but its interface is on the crude side.

32 runs under Windows 95 and NT, but connects to a separate Win 3.1 edition; LapLink comes with a Windows 3.1 version, but doesn't yet support NT. Microcom, 800/822-8224, http://www.microcom.com/

READER SERVICE NO. 725

CLOSE-UP 6.5

PRO: One version works in DOS, Win 3.*x*, and Win 95; fast performance in some remote control tasks; unlimited free phone support.

CON: DOS-based interface; sluggish file transfers; supports only 16 colors; cannot connect over the Internet.

A single remote access software package that runs on computers using DOS, Windows 3.*x*, or Windows 95 *sounds* like a good idea. But Norton-Lambert's $199 Close-Up 6.5 demonstrates how tough it is for a product running under plain old DOS to support Windows 95 well. The package uses a somewhat confusing DOS-based installation routine that makes you install your modem manually, even if you've already set it up with Win 95's TAPI. Once I was up and running, the package presented me with a keyboard-oriented, character-based DOS interface on my off-site system—neither pretty nor intuitive by modern standards.

Close-Up is a single-tasking program that can handle file transfers or remote control, but not both at once; and in addition remote control sessions are limited to 16 colors. Close-Up is also the only package in our roundup that does not support long file names and can't connect over the Internet.

Performance is another problem area. Though it remotely controlled Picture Publisher and Excel quickly, Close-Up trailed the pack in nearly every other test. The Word 95 remote control test went especially awry: Close-Up took more than half an hour to complete tasks that the next-slowest product finished in less than six minutes.

Close-Up 6.5 does include a simple scripting language that you can use to automate file transfers. Norton-Lambert is one of the few vendors in this review that provides unlimited free phone technical support—but you do pay for the cost of the call. The package is worth considering if you need to control Windows 95 from a DOS computer, but Close-Up's slow performance and lack of up-to-date features take it out of the running for Windows-to-Windows remote access. Norton-Lambert, 805/964-6767, http://www.nortonlambert.com

READER SERVICE NO. 726

COSESSION REMOTE 7.0

PRO: Inexpensive; one version works in DOS, Win 3.1, and Win 95; unlimited free phone support.

CON: Slow; disorganized interface; doesn't suppress Windows wallpaper.

The most noteworthy feature of Artisoft's CoSession Remote 7.0 is its price: At $79, it's less than half the price of some competing products. But while it's easy on the budget, CoSession lacks many of the latest conveniences offered by LapLink, Procomm Plus, and other products. Overall performance is also poor: Except for a respectable third-place finish in our Word file transfer test, it was one of the slowest products we tested, for both file transfer and remote control.

Like Close-Up, CoSession Remote runs under DOS, Windows 3.1, and Windows 95; but Win 95 users give up a lot in return for that compatibility. The program doesn't take advantage of TAPI, so you've got to configure your modem when you install the package. And its stab at support for long file names is half-hearted at best: Folders with long names are displayed accurately, but the file names within appear in truncated form. CoSession provides lots of useful remote control and file transfer features, but its wizardless interface is a bit of a jumble. I sometimes had trouble tracking down the features I was looking for, and the package uses abbreviations that may stump you if you're a newcomer to remote access terminology.

CoSession and Close-Up are the only packages here that can't suppress your office PC's background wallpaper during a remote control session, so be prepared for long waits as the software pumps it across the remote link. Both CoSession and Close-Up also make you run different pieces of software on the office and off-site PCs—a problem only when you forget which is which and launch the wrong one. Naturally, I did just that from time to time. Artisoft, 800/846-9726, http://www.artisoft.com/

READER SERVICE NO. 727

CoSession Remote's most notable feature is its low price.

CLOSE-UP 6.5's DOS-based installation program doesn't offer much in the way of automation.

A perfect 10 on the feature scale.

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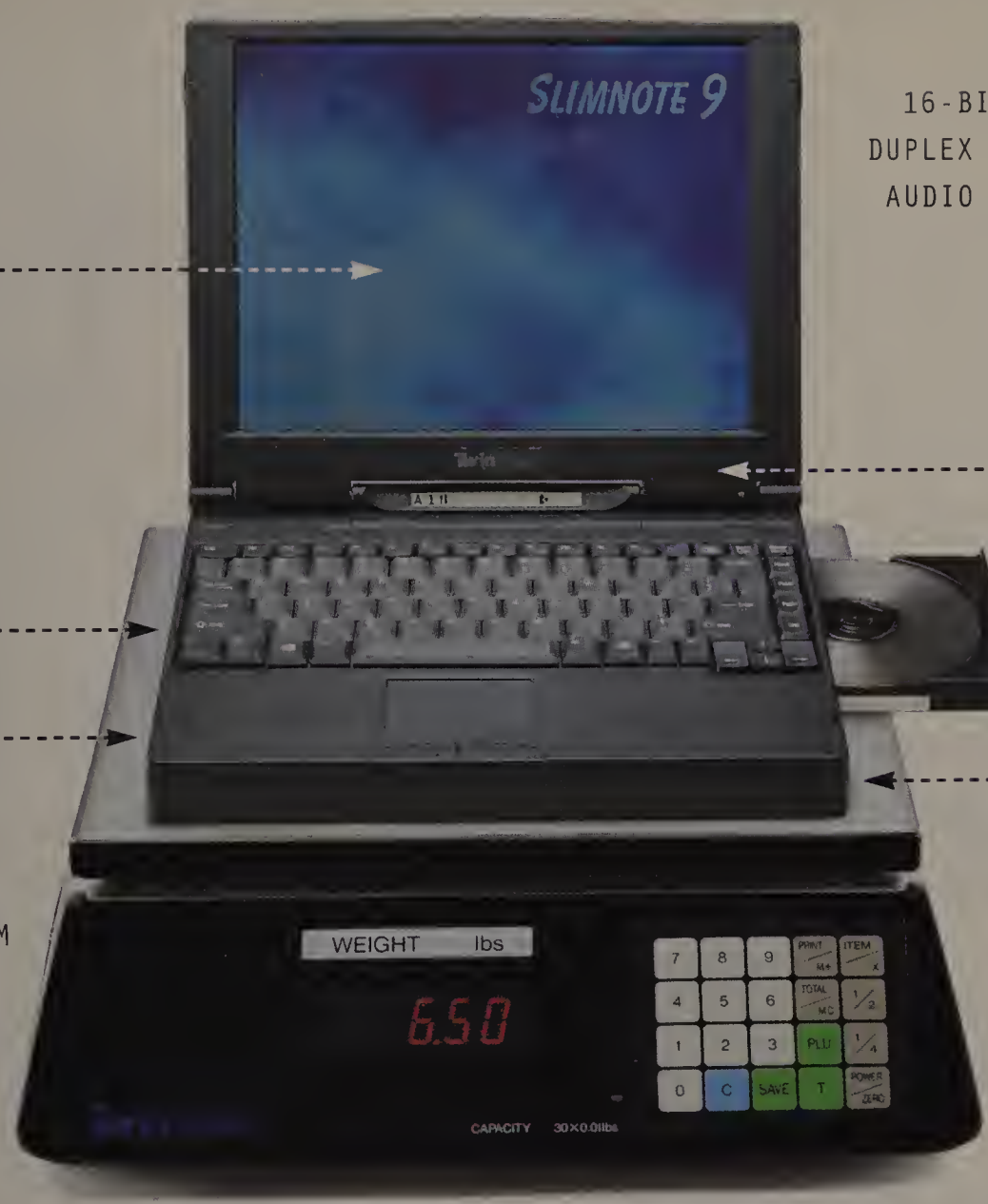

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Circle 240 on reader service card

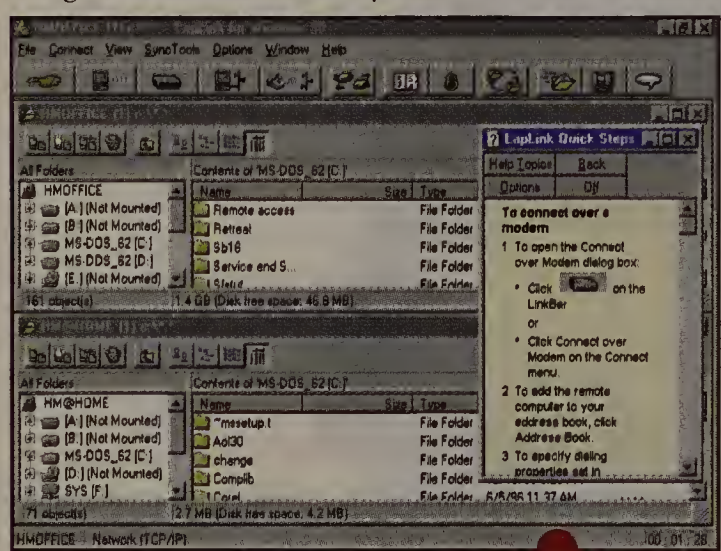
LAPLINK FOR WINDOWS 95 7.5

PRO: Easy to use; fast and versatile file transfers; includes cable for direct connections.

CON: No printer rerouting; uneven remote control performance.

Remote access is an inherently complex process. You're dealing with multiple desktops and multiple drives, not to mention all the pitfalls that attend communication by analog modem, ISDN, or the Internet. No package here eliminates all the potential hazards, but Traveling Software's $149 LapLink for Windows 95 7.5 comes closest, with a thoughtfully designed interface that's suitable both for first-time telecommuters and old pros. Along with Carbon Copy, it's a Best Buy.

This product does several unique things to eliminate the annoyances associated with remote access. LapLink is the only package we saw that completely does away with the confusing concept of setting your office system to "wait" for an incoming call from an off-site system; it's always ready to connect the moment you launch it. Dialog boxes include hints and brief descriptions of their purpose. A help system called Quick Steps keeps a window open with instructions for using whatever section of the package you're in. You can shut this off once you know your way around the program.



LAPLINK'S QUICK STEPS, powerful file transfers, drag-and-drop capabilities, and other features make it a Best Buy.

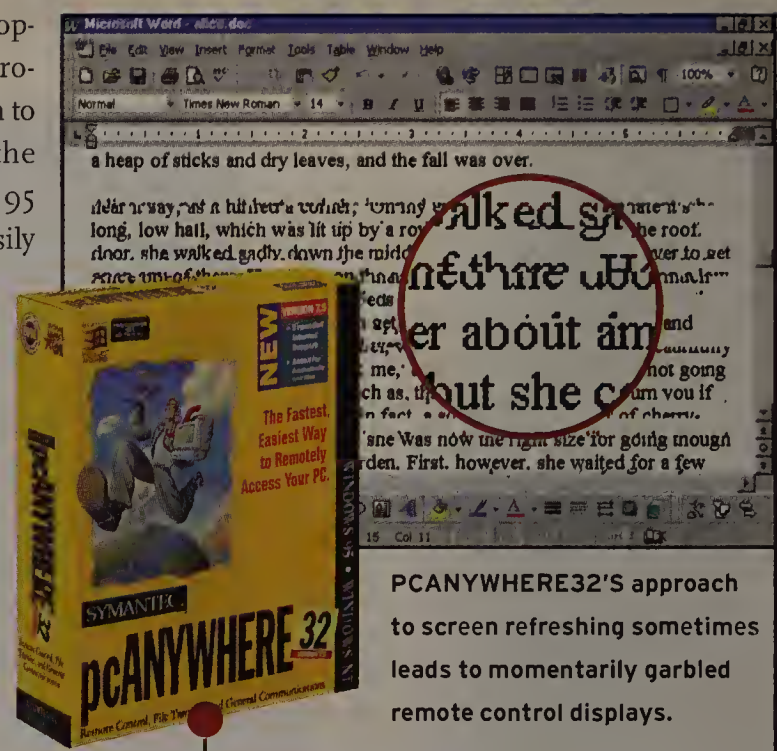
LapLink started out as a file transfer utility, and it continues to handle this task uncommonly well. Its file transfers were easily the fastest, beating second-place Procomm Plus by 21 percent and last-place Close-Up by 160 percent. Selecting different synchronization options is simple, and the program is even smart enough to move deleted files into the office system's Windows 95 Recycle Bin, so you can easily retrieve them if you have second thoughts.

LapLink does not have a full-fledged scripting language, but the package's straightforward Xchange Agent feature allows you to drag and drop folders and files to create predefined synchronizations that you can subsequently perform with a few mouse clicks or schedule for unattended operation using the Windows 95 System Agent.

LapLink's remote control is also easy to use, but its speed was erratic. LapLink tied for first place with Close-Up in the Organizer tests, but it was the slowest product at handling Excel. Ultimately, I opted for some features that juiced up performance by reducing fidelity to the office system's display; for instance, I chose to suppress large bit-map images such as splash screens that normally appear when applications are launched.

One unusual shortcoming is LapLink's inability to reroute printer output, which would enable you to print a document at home when remotely controlling your office system. It's the only remote access package here that doesn't provide this option. LapLink comes with a Windows 3.1 version that shares the Windows 95 edition's appealing look and feel, but not all of its newest features (such as the Xchange Agent). Nevertheless, it's a strong enough version to justify buying LapLink now if you're still running Windows 3.1 but plan to move to Win 95 (on one or both of your PCs) in the future. Traveling Software, 800/343-8080, http://www.travsoft.com

READER SERVICE NO. 728



PCANYWHERE32'S approach to screen refreshing sometimes leads to momentarily garbled remote control displays.

PCANYWHERE32 7.5

PRO: Full of features; excellent security and options for multiple users; includes cable for direct connections.

CON: Interface is occasionally confusing; screens sometimes appear garbled.

If you're looking for a remote access package that's flexible enough to meet every possible need in your organization, Symantec's $149 pcAnywhere32 7.5 is a strong contender: It's the fullest featured remote access program we examined, and its overall performance is above average. Nonetheless, for basic telecommuting with a minimum of complexities, there are better choices.

Although pcAnywhere32 runs only under Windows 95 and Windows NT, it can connect to separate DOS and Win 3.1 versions. The package boasts valuable but uncommon features such as a scripting language (for automating file transfer tasks) and built-in virus checking. You can also set up a networked PC as a gateway that lets several users share a single remote connection—an economical alternative to supplying everyone with separate modems and phone lines. Another impressive capability: When connecting over the Internet, pcAnywhere32 can find your waiting office PC as long as you know the sub-Net address, even if you don't know the specific IP address. ▶

LapLink comes closest to eliminating **telecommuting's** hassles.

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This feature is invaluable if your Net connection at work assigns your office PC a different IP address every time you log on. But for all of pcAnywhere's power, it lacks some of the elegant usability touches of Carbon Copy, LapLink, and Procomm Plus. Remote control sessions, for instance, appear in an unorthodox window with icons but no standard menus. There's no interactive help system to match LapLink's Quick Steps; and pcAnywhere32's wizards do a bare minimum of configuration, unlike the more extensive ones in Procomm Plus.

By the numbers, pcAnywhere32's performance in our Word and Excel remote control tests *looks* downright remarkable—it completed them in less than half the time of any other product—but there's a big catch. Unlike the other products here, pcAnywhere32 refreshes the off-site PC's display by comparing its screen to that of the office system and sending only the areas that have changed. When I did something that involved rapid screen changes, such as scrolling through a Word or Excel document, pcAnywhere32 sometimes garbled the display temporarily as it rushed to keep up. This effect crops up only occasionally, but when it does, it's distracting at best and bewildering at worst. Picture Publisher images also looked peculiar during pcAnywhere remote control sessions—a problem Symantec acknowledges. Symantec, 800/441-7234, http://www.symantec.com/

READER SERVICE NO. 729

PROCOMM PLUS 95 4.0

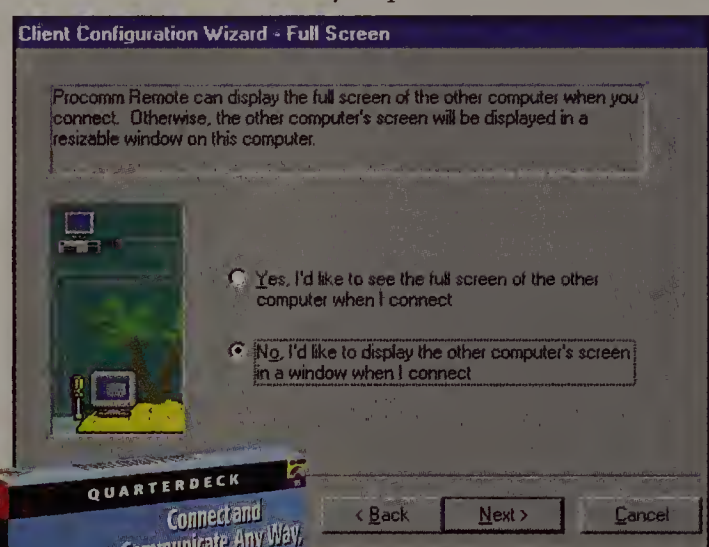
PRO: Easy to use; fast; extensive communications features.

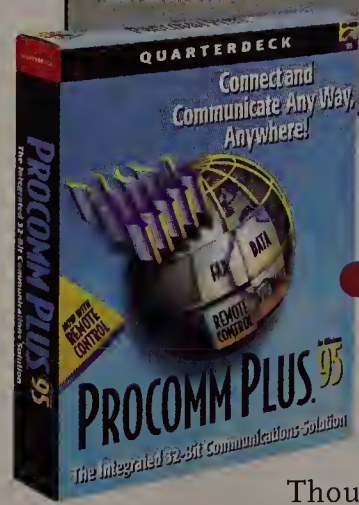
CON: Works with Windows 95 only; some of the wizards can't be turned off.

Quarterdeck's $139 Procomm Plus 95 4.0 communications suite does so many things well—terminal emulation, fax, Internet e-mail, and Web browsing (with an integrated copy of Microsoft's Internet Explorer 3.0)—that you might overlook its remote access features, which are new in this release. They make Procomm the most complete communications program on the market, and one that's well worth considering, especially if you're a newcomer to remote access.

For all of pcAnywhere's power, it lacks some of LapLink's usability touches.

The package is a good choice for neophytes because of its outstanding wizards, which use plain English to explain virtually every feature and option. The only catch is that some functions are available *only* through the wizards, and using them involves many steps. The wizards became far less welcome once I was familiar with the program and just wanted to make quick changes to the setup.





PROCOMM PLUS uses wizards to explain the ins and outs of remote access configuration.

Though it never ranked as the fastest product in any single test, Procomm was among the top three in most areas—pretty impressive. This package doesn't match the potent options of Carbon Copy or pcAnywhere32, but it's got all the basic file transfer and remote control tools, as well as some advanced ones like the ability to shut off access if someone repeatedly tries to log in with an invalid password. Its other communications features go far beyond such built-in Windows 95 applets as HyperTerminal and Microsoft Fax, and are tightly integrated into a single interface.

Procomm's most serious liability is that it works only under Windows 95. That's not a problem if you just want to connect two Win 95 PCs, but it's a fatal limitation if you're looking for one package to meet the needs of both Win 95 and Windows 3.*x* users within your company (not to mention early adopters of Windows NT 4.0). Quarterdeck plans to add support for Windows 3.1 and NT to future versions of Procomm Plus. By the time you read this, the company should also have released Rapid Remote, a package that's essentially Procomm Plus's remote control and file transfer features spun off as a stand-alone product. At $69, Rapid Remote should be a terrific value for providing Windows 95–to–Windows 95 remote access. Quarterdeck, 310/309-3755, http://www.quarterdeck.com/

READER SERVICE NO. 730

REACHOUT 6.0

PRO: Lets you create a personal FTP server; includes Windows 3.1 version.

CON: Fussy about graphics settings; middling overall performance.

If you've downloaded many files from the Internet, you've encountered FTP, a protocol that lets you exchange files with a distant PC. Unique among the packages here, Stac's $139 ReachOut 6.0 lets you easily turn your office PC into a password-protected personal FTP server. With ReachOut running on your office system, you can copy files from the office PC by using a Web browser on any PC that's got an Internet connection: ReachOut does not need to be installed on the off-site PC.

There are some limitations: Your office system must have a direct, full-time Internet connection such as a T1 line; and you can only do file transfers this way, you can't perform remote control. If you want to move files in both directions, you may need a separate FTP utility; Internet Explorer and the standard edition of Netscape Navigator can only download files, they can't upload them.

Its FTP server feature aside, ReachOut handles basic file transfer and remote control reasonably well, though not without some obstacles. It offers an ▶

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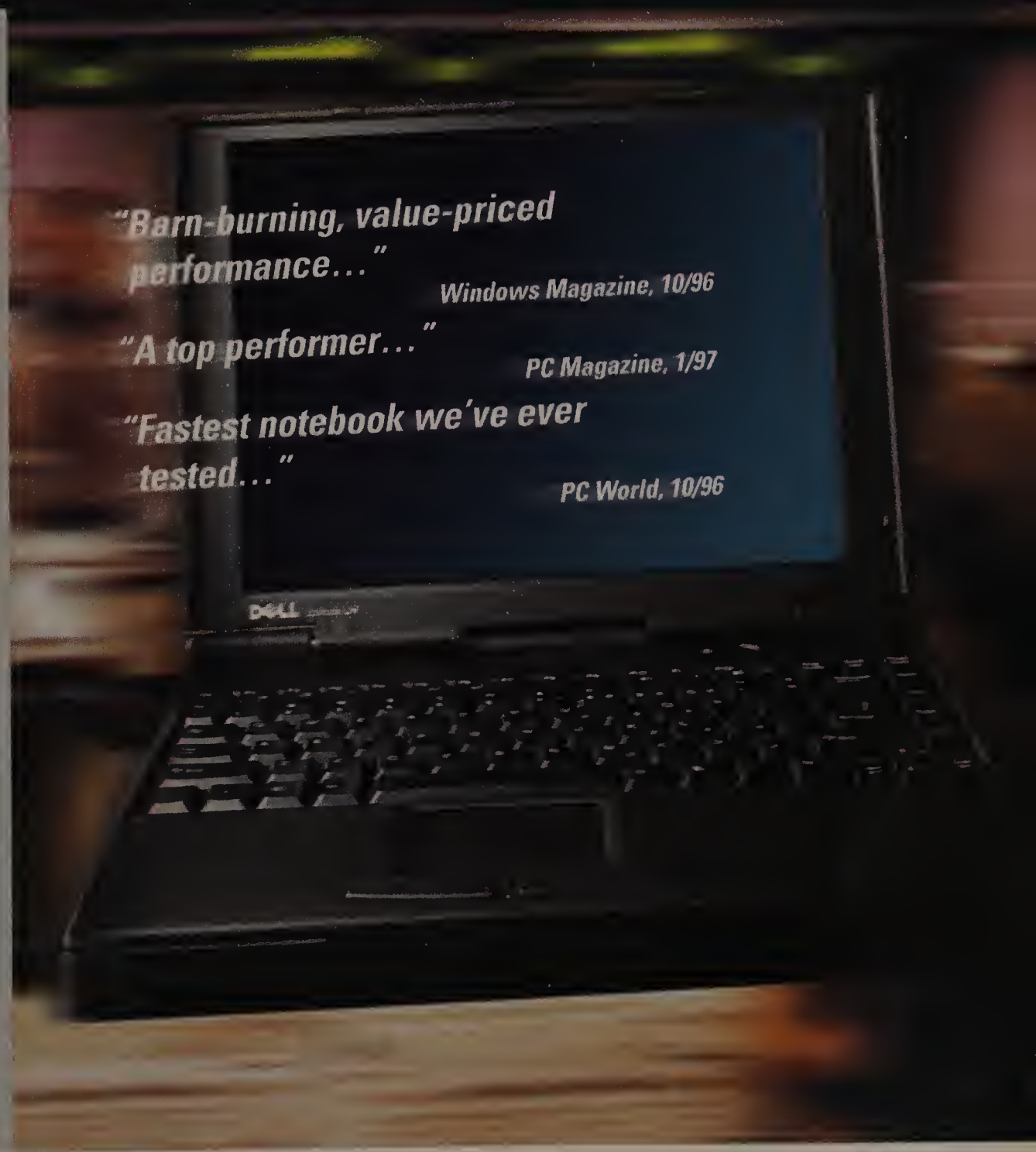

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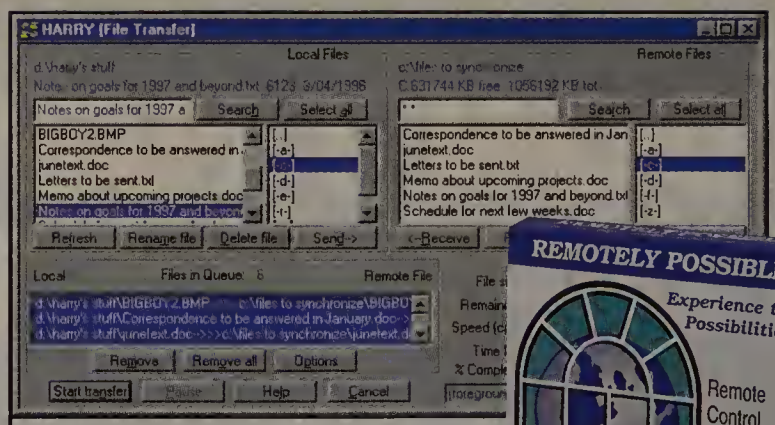
extremely broad range of options, including a scripting language for automating file transfer tasks, lots of security options, and built-in virus detection during file transfers. Like LapLink, ReachOut comes with a Windows 3.1 edition that's not identical in features but can interoperate with the Win 95 version.

For several reasons, though, ReachOut 6.0 wasn't a contender for a Best Buy. Except for its second-place finishes in the Excel and Organizer file transfer tests, its performance was so-so; and it was the slowest product by far in our Picture Publisher file transfers. By default, its remote control runs in full-screen mode; and you've got to remember arcane keyboard commands to put it into a resizable window that makes it easier to move between the off-site and office desktops.

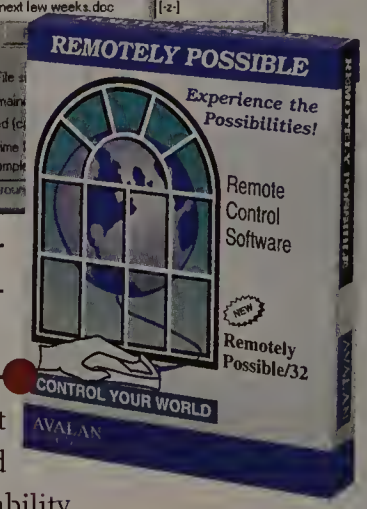
When I tried to remotely control a system with a 65,536-color display from one with 256 colors, ReachOut flashed a warning message and displayed garbled colors. Other packages showed the remote display correctly, albeit in only 256 colors. Stac advises ReachOut users to use the same video cards and drivers in both PCs. That may help prevent compatibility problems with any remote access package, but it's not always feasible.

Stac plans to ship ReachOut 7.0 by the time you read this. The new version, which wasn't available in time for this review, will be the first remote access package here to support DOS, Windows 3.1, Win 95, and NT in a single box. ReachOut 7.0 will let you remotely control your office PC from within your off-site PC's Web browser, using a plug-in for Netscape Navigator or an ActiveX control for Internet Explorer. Stac, 800/279-7822, http://www.stac.com/

READER SERVICE NO.731



REMOTELY POSSIBLE'S file transfer utility is awkward, with undersized windows and an intermediary queue.



REMOTELY POSSIBLE/32 3.0

PRO: Good remote control performance with Word and Excel; light version is free.

CON: File transfer is slow and cumbersome; spartan interface and skimpy on-screen help.

Avalan's $169 Remotely Possible/32 3.0 certainly is svelte: It comes on a single floppy and eats up just 2MB of hard disk space—one-eighth the room demanded by pcAnywhere32. That's nice if your disk is bulging at the seams or you've got a notebook with a skimpy hard drive, but Remotely Possible's usability and overall performance suffer in comparison with the top products here. More than most of the packages I used, this one seems aimed at users who are already comfortable with remote access concepts and communications terminology. For instance, each time you make a connection, you must choose whether to do so by modem or via a network protocol: IPX, TCP/IP, or NetBIOS. It's the only native Win 95 package here that doesn't use wizards to help new users, and the on-screen help is pretty superficial—though the printed manual is better.

I liked Remotely Possible/32's snappy remote control of Word and Excel—it was second in speed only to pcAnywhere32—but its file transfer performance was much slower than that of any other package we reviewed except Close-Up. The interface looks and works nothing like typical file management tools such as the Windows 95 Explorer. Instead of simply dragging and dropping files and folders between the two systems, you must move the items to a third window, which displays a queue of files waiting to be transferred. File lists appear in teeny windows that frequently cut off the ends of names, and the windows can't be resized to create room for long file names.

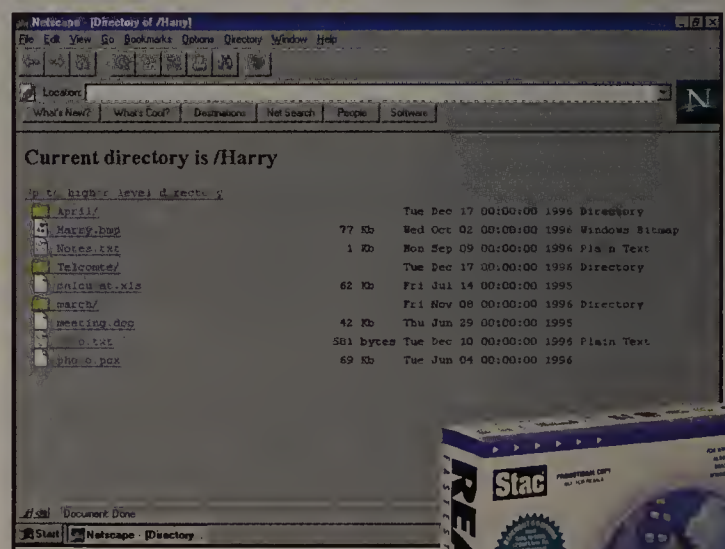
Some of Remotely Possible/32's strengths lie in areas other than telecommuting. For example, you can set it up to let multiple users on a network view what's happening on a single system, a useful feature for classroom training on computer subjects. Avalan also offers a uniquely generous demo version: After you download it from the company's World Wide Web site, it's fully functional for 30 days. From then on, file transfer and some configuration options are shut off, but remote control works forever, at no cost. Avalan Technology, 800/441-2281, http://www.avalan.com/

READER SERVICE NO. 732

Some of Remotely Possible's strengths lie outside telecommuting.

Harry McCracken is a senior associate editor for PC World. *Performance testing by Kevin Mitchell of the PC World Test Center.*

For more information on all products in this article, circle reader service no. 909. ■



WITH REACHOUT on your office PC, you can use any PC with an FTP client (such as Netscape Navigator) to get to its files.

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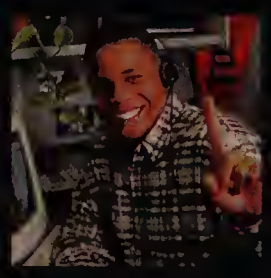
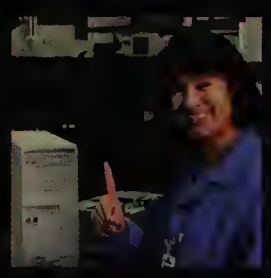

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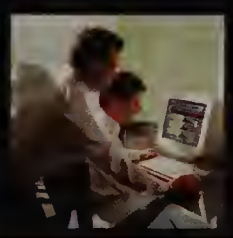

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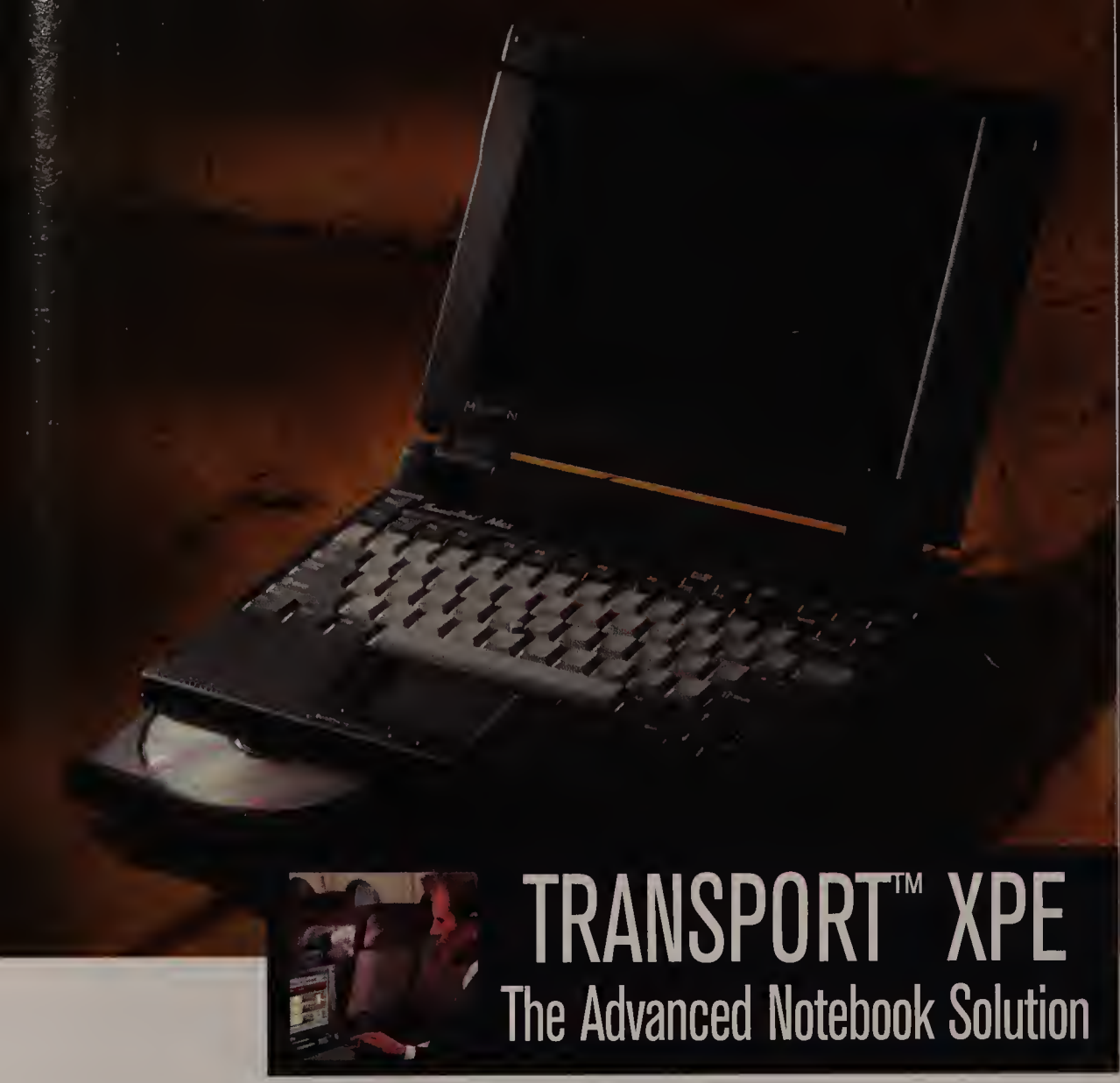

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- Microsoft Windows® 95 and MS® Plus! CD
- Microsoft Works 4.0 CD
- System soft® System Wizard application for automated problem resolution
- Quicken® Financial Pak: Quicken Deluxe 6.0, Quicken Financial Planner™, Quicken Parents' Guide to Money™, Quicken Family Lawyer™ and free TurboTax® 1
- Family Pak: ABC by Dr. Seuss, Thinkin' Things™ Collection 1, Earthworm Jim™ and Mechwarrior® 2
- Microsoft Home Pak: Publisher Deluxe97, Encarta® 97 Encyclopedia, Monster Truck Madness™ and CD sampler
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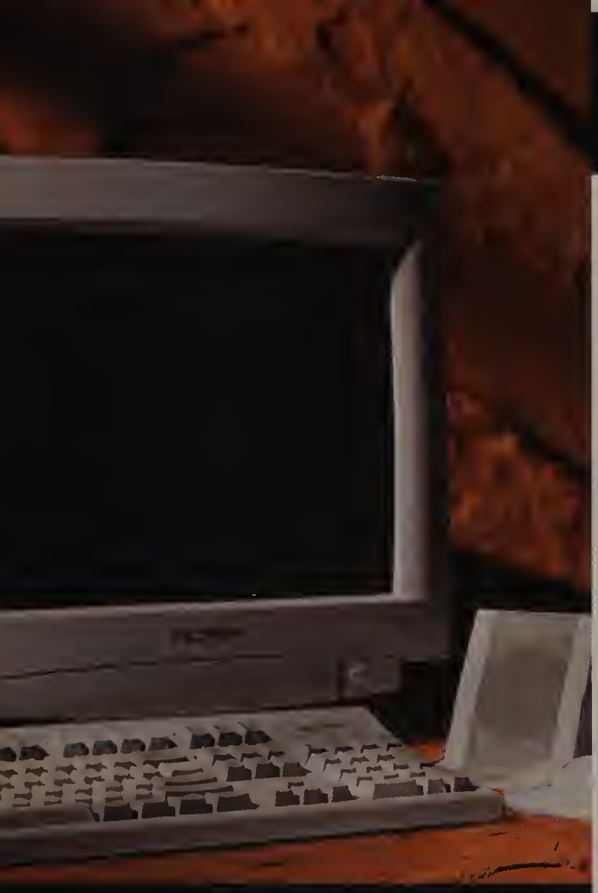

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- America Online and CompuServe trial memberships
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- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 and MS Plus! CD
- Microsoft Works 4.0 CD
- System soft® System Wizard application for automated problem resolution
- Quicken Financial Pak: Quicken Deluxe 6.0, Quicken Financial Planner, Quicken Parents' Guide to Money, Quicken Family Lawyer and free TurboTax 1996 coupon
- Family Pak: ABC by Dr. Seuss, Thinkin' Things Collection 1, Earthworm Jim and Mechwarrior 2
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[1] Upgrade from systems with standard 16-bit stereo sound card
[2] Requires SCSI host adapter
[3] V.34 modem includes trial memberships to CompuServe®, Prodigy® and America Online®
[4] V.34 modem includes trial memberships to CompuServe®, Prodigy® and America Online®, requires sound card
[5] Upgrade from systems with standard Micron 17" 17FGx color monitor
[6] Upgrade from systems with standard 64-bit 2MB video card
[7] 1st year on-site service is available in the United States and in limited areas in Canada from third-party service provider per customer's agreement with provider.
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- 512KB pipeline burst cache, flash BIOS
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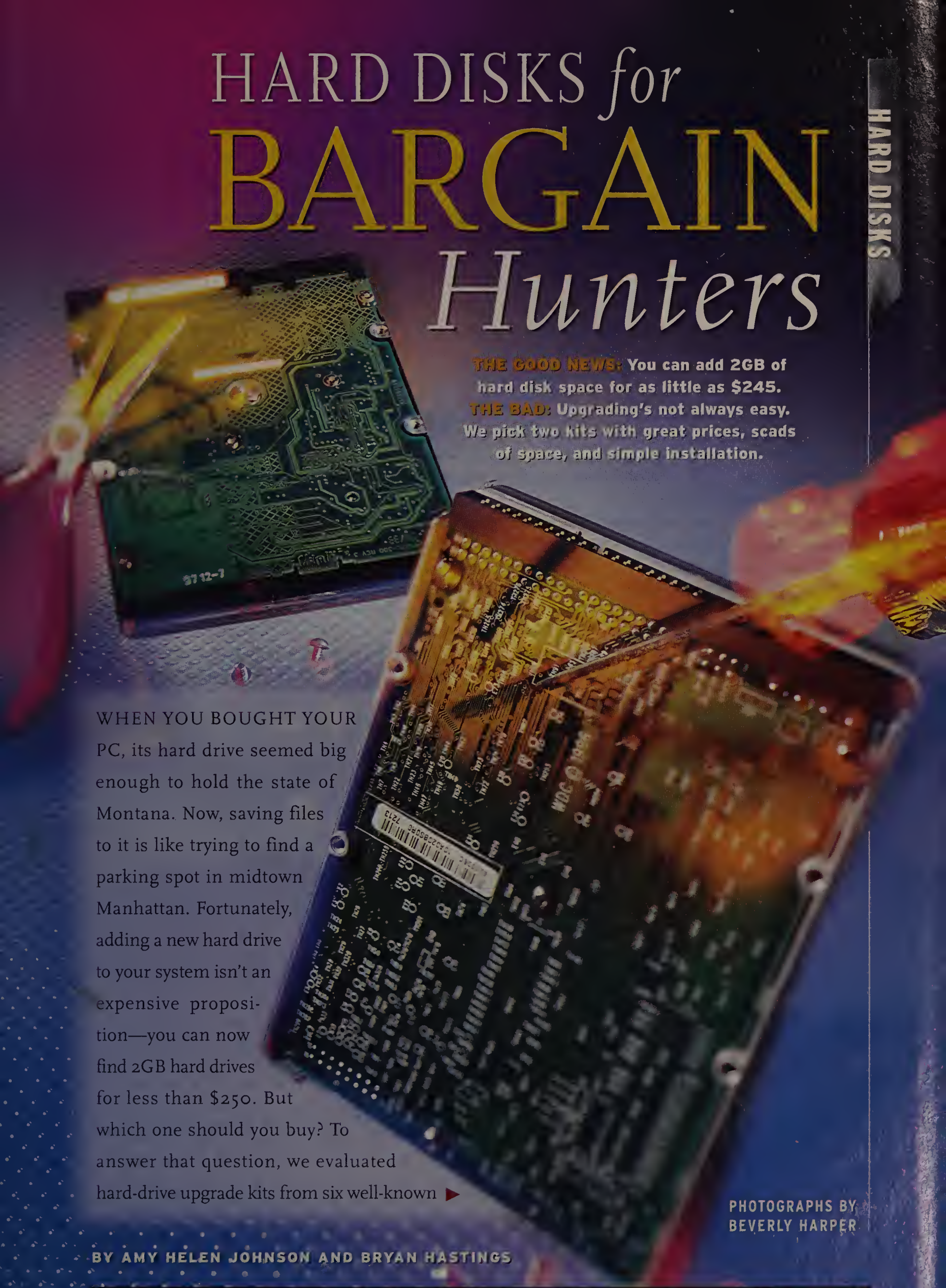
HARD DISKS *for* BARGAIN *Hunters*

THE GOOD NEWS: You can add 2GB of hard disk space for as little as $245. **THE BAD:** Upgrading's not always easy. We pick two kits with great prices, scads of space, and simple installation.



WHEN YOU BOUGHT YOUR PC, its hard drive seemed big enough to hold the state of Montana. Now, saving files to it is like trying to find a parking spot in midtown Manhattan. Fortunately, adding a new hard drive to your system isn't an expensive proposition—you can now find 2GB hard drives for less than $250. But which one should you buy? To answer that question, we evaluated hard-drive upgrade kits from six well-known ▶

PHOTOGRAPHS BY BEVERLY HARPER

BY AMY HELEN JOHNSON AND BRYAN HASTINGS

manufacturers: Fujitsu, IBM, Maxtor, Quantum, Seagate, and Western Digital.

To qualify for the review, a kit had to include the hardware needed to mount the drive in our test PCs, and the software to get the drive up and running to its full capacity. We also confined our testing to IDE drives that hold at least 2GB of data—the minimum size you should get if you're making the effort to upgrade. Nearly all desktop computers are set up to accept an IDE hard drive, and IDE offers plenty of performance for most people, as long as they aren't using their system as a network server. While SCSI drives are also common, they aren't a sensible choice for most single-user PCs. SCSI drives offer greater performance than their IDE siblings, but you most likely would have to install an interface card in your PC before you could install a SCSI hard drive.

BEST BUYS

OUR TOP CHOICES in IDE hard drives are Western Digital's Caviar 22100 and Seagate's Medalist Pro 2520. The 2.1GB Western Digital model is among the least expensive we tested, one of the easiest to install, and a decent performer. The Seagate model costs just $40 more than the Caviar 22100; it can store up to 2.4GB of data, requires minimal effort to get up and running, and performs well.

TIP BACK UP YOUR DATA BEFORE UPGRADING: *We can't* STRESS *this enough.*

OUR BEST BUYS

WE JUDGED the drive kits on price, performance, features, ease of installation, and support. In most categories, the differences we found were too small to matter to most users. You can save on the cost per gigabyte if you go for the largest drives reviewed here, but we didn't see much price variation between the 2GB and 3GB drives. We saw little performance difference between the drives when it came to standard business applications, though we saw some variance in more specialized tasks. As for features, these kits include the basics: hardware for mounting the drive, and software for setting it up.

The greatest disparities among these hard drive kits showed up in their technical support and ease of installation. Based on our experience, the drive kits from Seagate and Western Digital are the best in these categories. With their thorough manuals and well-designed installation software, these drive kits will have most novices up and running in under an hour. By contrast, the IBM kits, with their sparse manuals and unhelpful tech support, could leave new users struggling all day. Top marks for ease of installation helped determine our two Best Buys: Seagate's Medalist Pro 2520 and Western Digital's Caviar 22100.

Some of the other drive kits reviewed here may be best for specific needs. If you work a lot with very large files and disk-intensive applications such as databases and high-end graphics programs, then take a good look at Maxtor's 5GB DiamondMax 85120A and IBM's 4.2GB DeskStar 4. While you may have to spend some time installing them, these two drives are exceptionally roomy and placed well ahead of the rest in our Access 7.0 and

2GB AND LARGER HARD DRIVES

	HARD DRIVES	Street price (1/10/97)	Capacity (GB)	STANDARD FEATURES: Comments	Spin rate (rpm)	Seek time (ms)	Cache (K)
BEST	Seagate Medalist Pro 2520* 408/438-8111 www.seagate.com	$290	2.4	Affordability and excellent setup software make this a top choice, especially for beginners.	5400	11	128
BEST	Western Digital Caviar 22100* 714/932-4900 www.wdc.com	$250	2.1	Well-written manuals, low price, and decent performance make this a great overall value.	5200	11	128
GOOD	Western Digital Caviar 32500 714/932-4900 www.wdc.com	$310	2.5	A bit pricier than our Best Buys; very good all around.	5200	11	128
GOOD	Western Digital Caviar 33100 714/932-4900 www.wdc.com	$350	3.1	Simple setup routine and good features overall make this our first choice in a 3GB+ drive.	5200	11	128
SATISFACTORY	Fujitsu M1624TAU 800/626-4686 www.fcpa.com	$245	2.2	LED-equipped faceplate is a nice extra; sparse manuals may frustrate technophobes.	5400	10	128
SATISFACTORY	Fujitsu M1638TAU 800/626-4686 www.fcpa.com	$290	2.5	Comes with LED-equipped faceplate; documentation is uninformative.	5400	10	128
SATISFACTORY	IBM DeskStar 3 800/426-2968 www.pc.ibm.com	$375	3.2	Technical support round the clock; tech personnel can be impatient, manuals unclear.	5400	9.5	128
SATISFACTORY	IBM DeskStar 4 800/426-2968 www.pc.ibm.com	$480	4.2	Great performance and 24-hour support; manuals and tech support quality are substandard.	5400	9.5	128
SATISFACTORY	Maxtor DiamondMax 85120A 800/262-9867 www.maxtor.com	$500	5.0	Large capacity and excellent performance; installation manual is short on specifics.	5400	9.7	256
SATISFACTORY	Quantum Bigfoot CY 6.4 408/894-4000 www.quantum.com	$499	6.4	Monster capacity and lowest cost per gigabyte; a little pokey on performance tests.	3600	14	128
SATISFACTORY	Seagate Medalist 2132 408/438-8111 www.seagate.com	$259	2.1	Very easy to install; sluggish performance on disk-intensive apps.	4500	12.5	128

*Best Buy ● Yes ○ No

[1] Able to monitor itself for signs of problems and report this information to the user.

Photoshop 3.0 Pentium-90 tests. If performance isn't critical but you're looking for tons of capacity, start with Quantum's Bigfoot CY 6.4. This $499 drive offers a whopping 6.4GB of file storage.

DRIVE PERFORMANCE

THE BETTER a drive performs, the less time you have to spend staring at Windows' hourglass, waiting for applications to open and files to save. To obtain a complete performance profile of these drives, we tested them on both a Pentium-90 and a 486DX2-66 system, running three tests on each. The first of the three tests was PC WorldBench 1.0, which stresses general business tasks. The other two tests, which involve large Microsoft Access 7.0 and Adobe Photoshop 3.0 files, were designed to highlight any performance differences these drives may have; these two tests perform a tremendous amount of reading from and writing to the hard drive.

On the Pentium-90 test bed, PC WorldBench scores varied by less than 5 percent. We saw some dramatic performance differences, however, in the disk-intensive tests (see "Maxtor, IBM Fastest Overall"). Maxtor's DiamondMax and IBM's DeskStar 4 placed well ahead of the pack in our Microsoft Access and Adobe Photoshop tests. Seagate's Medalist 2132 was almost 30 percent slower than the two top performers in our Access test, where the script manipulated a 49MB database file. The most dramatic difference was in the Photoshop test, where the Pentium PC using the DeskStar 4 took a little over 2 minutes to complete the job. The same system using the Medalist 2132 took almost 4 minutes to complete the task, making it nearly 80 percent slower.

SASQUATCH OF HARD DRIVES: Quantum's Bigfoot CY 6.4 (front) is larger than a typical drive, but it holds 6.4GB of data.

In our tests on a 486 test bed, we found so little performance variation among the drives that our conventional Test Report would fail to show significant differences. The exception was the Adobe Photoshop test, where the fastest drive, IBM's DeskStar 4, finished in 30 percent less time than the slowest drive, Seagate's Medalist 2132. The PC WorldBench and Access test scores varied by only a few percentage points. The minimal performance differences we did see on the 486 system were most likely due to speed bottlenecks in the computer itself.

Many factors contribute to overall drive performance. But the spin rate—how many times per minute the drive turns on its spindle—is one of the most important. A drive that spins faster allows data to be read and written more quickly. So, of this group of drives with spin rates ranging from 3600 revolutions per minute to 5400 rpm, it's no surprise that most of the 5400-rpm drives ended up at the top of our performance chart.

SMART-enabled[1]	Format (inches)	Rails/ adapter kit	Bundled software	SUPPORT Warranty (years)	Weekday support (hours)	Weekend support	Reader service number
○	3.5	●/●	Disc Wizard	3	9.5	–	788
●	3.5	●/●	EZ Drive	3	8	Sat.	789
●	3.5	●/●	EZ Drive	3	8	Sat.	790
●	3.5	●/●	EZ Drive	3	8	Sat.	791
●	3.5	●/●	Disk Manager	1	12	–	792
●	3.5	●/●	Disk Manager	1	12	–	793
●	3.5	●/●	Disk Manager	3	24	Sat., Sun.	–
●	3.5	●/●	Disk Manager	3	24	Sat., Sun.	–
●	3.5	●/●	Max Blast (Disk Manager)	3	12	–	794
●	5.25	●/○	Disk Manager, Norton Smart Doctor	3	8	–	795
○	3.5	●/●	Disc Wizard	3	9.5	–	796

INSTALLATION

WE EVALUATED drive installation by installing a drive as a second hard disk and also by replacing the existing disk. We tested both scenarios on two installation test beds: a Compaq Pentium-75 DeskPro with a Quantum Bigfoot drive, and a Polywell Poly 486-66 with a Western Digital Caviar drive. We also took into consideration the quality of the documentation and setup software, as well as the company's technical support.

Even in the best case, installing a hard drive is not always simple. Our experience ranged from relatively easy to difficult. On the bright side, hard drives have become much more interoperable than they were in the past. Not long ago, two drives made by different companies often wouldn't work on the same IDE cable. However, none of the drives we tested had any problem being paired with the hard drives that came with our two installation test beds.

We also discovered that the older the ▶

PC, the greater the chances we had to do extra fiddling. Our Pentium-75 is a relatively new desktop that didn't throw us any curveballs. But on our 1992-vintage 486DX2-66 minitower, we hit a snag. One of the problems we had when installing drives on the older Polywell unit had to do with the fact that a typical hard drive installation requires you to boot the PC from a floppy. The boot floppy drive on the Polywell was a 5.25-inch drive. After a fruitless search for a 5.25-inch disk to boot from, we spent a half hour wading through the manual to figure out how to boot from the 3.5-inch drive.

We found four steps of the installation procedure to be the same for the drive addition and drive replacement tests: (1) setting jumpers on the drive, (2) inserting the drive into a free bay on the PC, (3) editing the PC's Basic Input Output System so that the system can recognize the drive, and (4) partitioning and formatting the drive. Drive replacement required a few extra steps that we'll discuss later on.

TIP GOT ENOUGH SPACE? *If you're going to* ADD *a hard drive to your computer, make sure you have a* FREE DRIVE BAY *that has at least an* INCH *of clearance.*

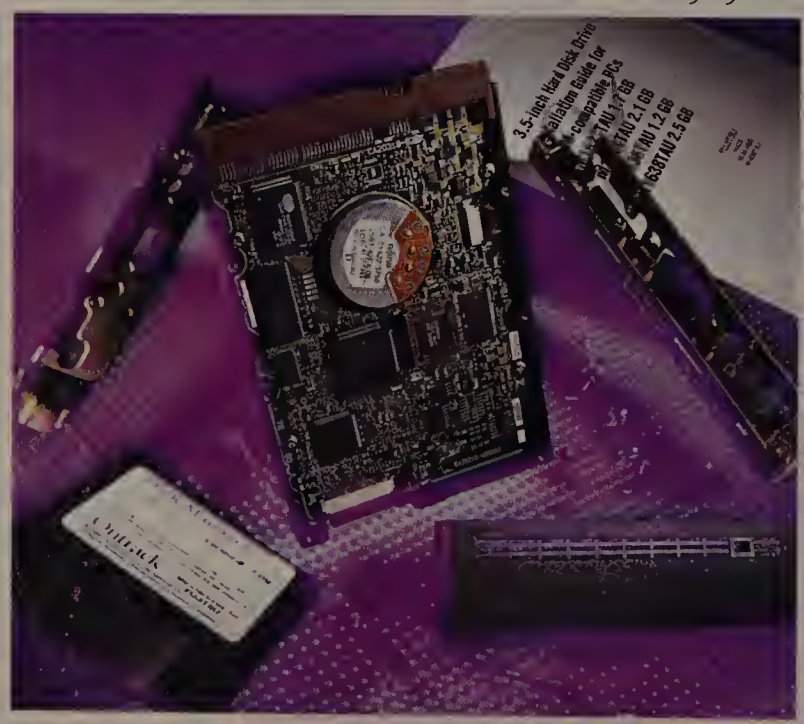
SETTING JUMPERS

THE MOST DIFFICULT THING about setting jumpers is getting a good grip on them. A jumper is a small clip about the size of a match head; trying to fit it over a pair of pins on the hard drive can make even a surgeon feel fumble-fingered. Depending on the pairs of pins you connect with jumpers, your drive is configured as a primary (master) unit, a secondary (slave) unit, or as a stand-alone drive. (For the drive addition test, we configured the new drives as slaves.) The two Seagate drives and the Western Digital Caviar 32500 and 33100 drives made it easy for us to figure out which jumper settings were which, because these drives had handy diagrams pasted right on them. For the other hard drives, we had to hunt through their manuals to find the correct jumper settings.

LEADERS AND FOLLOWERS: You can set jumpers (left) to make the drive a master (boot drive) or a slave (secondary drive).

INSERTING THE DRIVE

PUTTING THE drives into the PCs was painless. All the hard drives except the Quantum Bigfoot fit in 3.5-inch bays; the Bigfoot requires a 5.25-inch bay. The 3.5-inch drive kits include rails needed to install them in 3.5-inch bays, as well as adapter kits that allow the drives to be installed in 5.25-inch bays. The adapter kits can be very handy. Approximately one in six PCs we receive for our monthly Top 20 system review lacks a free 3.5-inch bay, but almost all of them have at least one free 5.25-inch bay. All these drives need at least an inch of vertical clearance in the drive bay.



IT'S KIT STUFF: All drive kits come with mounting rails and setup software. Fujitsu's kits also include LED-equipped faceplates.

You need a free external bay if you want to add a drive with an LED status light. The light's sole purpose is to blink when your hard drive is in the middle of a task. If you feel you need a status light, consider the two Fujitsu drives, which come with LED-equipped faceplates.

We handled the drives quite a bit during the jumper setting and drive insertion stages, exposing them to potential harm—from frying their electronics with static electricity to accidentally banging delicate components. The best-protected drive is the Seagate Medalist 2132, which has a full metal casing and static shield. The Seagate Medalist Pro 2520 and the three Western Digital Caviar units are also well protected, with only the bottom of their printed circuit boards exposed. The Fujitsu, IBM, Maxtor, and Quantum drives expose a lot of circuitry to possible damage.

EDITING THE PC'S BIOS

ONCE WE HAD A DRIVE physically installed, we fired up the PC and started acquainting it with its new drive. This is where things started to get a little tricky. The difficulty stems from the setup screen for the computer's BIOS, the chip that performs essential functions, including telling the PC how to communicate with its hard drives. In all cases, we had to go into the setup screen to tell the BIOS about the existence of the new drive. PCs have more kinds of BIOSes than Baskin

GETTING THE MOST
From Your Hard Drive

LIKE A VICTORIAN MANSION, most of today's hard drives are large but have a lot of wasted space. This loss can amount to several hundred megabytes on a 2GB hard drive. Fortunately, you can recover most of it. Here's how:

1. Identify your PC's file system. The *file system* affects how your computer stores data on the hard drive. To find out which file system your PC is using, first determine which version of Windows 95 you're using. Go to Control Panel and double-click the *System* icon. In the General tab, look in the upper-right corner under the 'System:' line. If it says 'Windows 95 4.00.950 A' or 'Windows 95 4.00.950', you've got an older version of Win 95, and your hard drive is set up for the FAT16 (file allocation table) file system. If it says 'Windows 95 4.00.950 B', then you've got the latest Win 95 release, dubbed OSR2.

If you've got OSR2, your hard drive is set up for either FAT16 or FAT32. To find out, double-click *My Computer* and click the drive you're interested in. Then right-click that drive and select *Properties* on the pop-up menu. Under the Label box you'll see a line starting with 'Type:'. If it says 'Local Disk(FAT)' or just 'Local Disk', then the disk is formatted for FAT16. Otherwise, it should read 'Local Disk(FAT32)'.

If you have OSR2, go to the next step. Otherwise, jump to step 3.

2. Choose between FAT16 and FAT32. If you're using FAT32, your drive is already set up to use its disk space economically. If you're using FAT16 and you have OSR2, you can reformat your hard drive for FAT32. But if you're not using it already, we don't recommend switching to FAT32 just yet. Microsoft warns this new file system may be incompatible with some device drivers and disk utilities. You may also want to hold off if you have a multiboot PC. Only Windows 95 OSR2 can read FAT32 partitions.

3. Partition your FAT16 disk. If you have FAT16, the best way to recover lost space is to partition your hard drive efficiently. (To partition a drive means to divvy it up into multiple smaller units that your PC sees as separate drives—for example, drives D:, E:, and F:.) If you're installing a new drive, use the bundled software to partition it. If you want to repartition an existing drive, the best way is to use either PartitionMagic 3.02 from PowerQuest, or Partition-It 1.0 from Quarterdeck. Either of these two utilities will allow you to repartition your hard disk without wiping out the data on it.

Under the FAT16 system, the larger your partition, the more wasted space—especially if you have many small files. Partitions between 1074MB and 2145MB are the most wasteful. Here, each file, no matter how small it is, ties up at least 32K of disk space. For example, if you have 1000 bookmarks, or Favorites, in your Internet Explorer browser, you'll be wasting almost 32MB of disk space. That's because each Favorite file hogs a 32K segment, or *cluster*, of space, even though the file is probably less than 100 bytes.

The way to recover lost space is to reduce the size of your partitions by creating more of them. The smaller the partition, the smaller the cluster size. Let's go back to our Favorites example. If you create a partition of 1073MB or less, the cluster size drops to 16K. In this case, each Favorite ties up only 16K of disk space. The total lost space from all the Favorites is then reduced from 32MB to 16MB, which means you've recovered 16MB of space. Drop the partition size to 536MB, and each Favorite takes up only 8K, once again halving the amount of wasted space.

Clearly, the more partitions you have, the more cumbersome file management becomes. There's no universal happy medium, but a rule of thumb for 2GB disks is to set up one 1073MB boot partition for system and program files, and a pair of 536MB partitions for data files such as text documents and spreadsheets.

- Partition-It 1.0 $49.95; Quarterdeck; 800/683-6696; http://www.quarterdeck.com
  Reader service no. 797
- PartitionMagic 3.02 $54.95; PowerQuest; 800/379-2566; http://www.powerquest.com
  Reader service no. 798

PARTITIONING SAVES SPACE

Each of the hundreds of small files or parts of larger files on your hard drive takes up a whole cluster (a drive's basic storage container) regardless of whether the cluster is filled. Partitioning lets you create smaller clusters, giving these files a better fit. Picture each file in a cluster as a serving of juice in its own glass. If you replace one large glass with two smaller ones, you can pour the serving into one glass, leaving you with free space in the other. Use four glasses, and you're left with even more free space.

and Robbins has ice cream flavors; each BIOS has its own commands for getting into the setup routine, and each has its own menus. None of the hard drive installation manuals or software packages we saw even came close to providing specifics about all the BIOSes, so we had to have our system manuals at hand.

The Seagate and Western Digital setup software and documentation do the best job here. The manuals from these two companies are the clearest in explaining how to get into the BIOS menu. These manuals also provide a place to write down the settings for the original drive, so you can easily reset the drive if you change its settings accidentally. Maxtor's installation sheet also covers all the bases, just in less detail than the Western Digital and Seagate manuals. IBM's manuals are even briefer—but they're still better than Fujitsu's, which furnish only a table of BIOS parameters without a hint of what you're supposed to do with it. Quan- ▶

tum's manual provides a place to record existing hard drive information, as well as tips for configuring the BIOS, but it doesn't give explicit instructions for performing this operation.

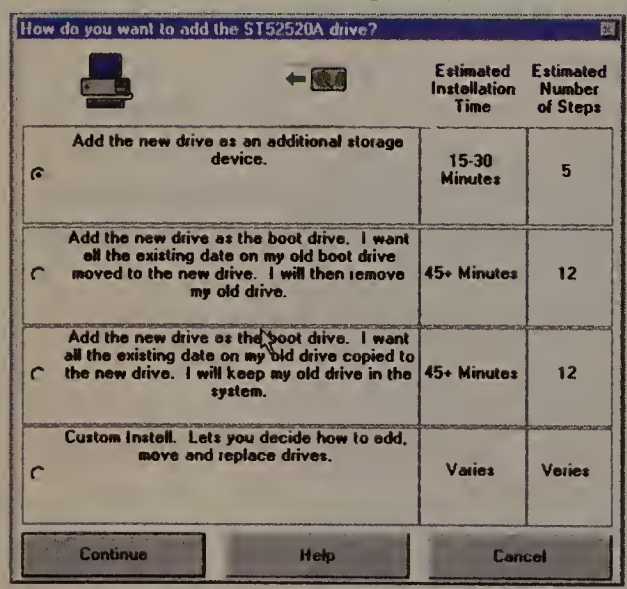
PARTITIONING AND FORMATTING

AFTER WE MADE IT through the BIOS setup, we moved on to the final step for getting the new drive up and running: partitioning and formatting. In all cases, these tasks were accomplished using bundled software: The two Seagate units come with the Windows-based Disc Wizard; the Western Digital drives come with EZ Drive; all the other drives come with a variant of Disk Manager.

GOOD COVER-UP: The Seagate Medalist 2132 (left) is fully shielded. Circuitry on most drives, such as the unit at right, is exposed.

If you're an old hand at partitioning and formatting drives, you'll probably prefer EZ Drive or Disk Manager. These two DOS-based utilities took us through the installation process more quickly than Disc Wizard. However, Disc Wizard is by far the most informative and the easiest to use. For the uninitiated, it's the obvious choice. In fact, Disc Wizard is the only one of the three that covers the entire installation process, not just formatting and partitioning. Seagate's instructions told us to run Disc Wizard at the beginning of installation. Disc Wizard analyzed the PC and generated a nifty custom installation sheet that walked us through the steps of setting the jumpers, inserting the hard drive, and editing the BIOS.

TIP OPEN SESAME. *If you don't have a* CLUE *as to how to go into your BIOS setup and you don't have the manual at hand,* TRY *one of these common* KEYSTROKES *before the PC starts to load Windows: <Esc>, <F1>, <F2>, <Del>, or <Ctrl>-<Alt>-S.*



How do you want to add the ST52520A drive?

	Estimated Installation Time	Estimated Number of Steps
Add the new drive as an additional storage device.	15-30 Minutes	5
Add the new drive as the boot drive. I want all the existing data on my old boot drive moved to the new drive. I will then remove my old drive.	45+ Minutes	12
Add the new drive as the boot drive. I want all the existing data on my old drive copied to the new drive. I will keep my old drive in the system.	45+ Minutes	12
Custom Install. Lets you decide how to add, move and replace drives.	Varies	Varies

Continue | Help | Cancel

AS PAINLESS AS IT GETS: Disc Wizard spells out your installation options in clear, plain language.

All setup programs formatted the drives automatically. Partitioning, however, required us to make some decisions, and none of the three packages gave us total guidance here. It's a little-known fact that partitioning your hard disk shrewdly can often buy you over 100MB per gigabyte of space (see "Getting the Most From Your Hard Drive"). Disc Wizard is the only software package whose setup program discusses efficient partitioning, and its explanation was hard to follow at times. The Western Digital drives also come with an explanation about efficient partitioning, but you have to go into the manual to learn about it.

The setup programs let us choose to customize our partition sizes or to accept default sizes. We were much better off customizing, because all three utilities made poor size choices for automatic partitions. For example, Disk Manager set up the 6.4GB Quantum Bigfoot with three partitions of 2.1GB and one of only 49MB. Why not set up four equal partitions, instead of creating a near-useless 49MB sliver?

The Quantum Bigfoot is the only drive we reviewed that is bundled with other software in addition to an installation utility. The Bigfoot comes with Norton Smart Doctor, a utility that works with drives that use Self-Monitoring, Analysis, and Reporting Technology. Smart Doctor reads the Bigfoot's SMART data and uses a stoplight image to indicate whether the drive is fine (green light) or has errors that could cause a hard disk failure (red light). (The Bigfoot got a green light.) Smart Doctor is a useful tool, though your best bet for guarding against data loss is to back up your data regularly.

REPLACING THE DRIVE

THE PROCESS OF REPLACING a drive is very similar to that of adding a drive. We took only two additional steps: Before we installed the new drive, we backed up our data from the original drive, then disconnected that drive. After the new drive was installed, we restored the data from our backup system to the new drive.

Unfortunately, none of the documentation we saw covers the backup and restore operations very well. In fact, only the IBM manual mentions it at all, and it is not nearly as clear as it should be. All of the manuals fail to make one important point: You should reinstall your operating system and applications from scratch, not just copy them from a backup device, especially if you're using Windows 95. ▶

TIP PLEASE BE GENTLE. *Remember that a hard drive is a very* SENSITIVE *device. You might damage it if you* DROP *it or if you* BUMP *it hard during handling.*

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We found least fault with the Western Digital and Seagate instructions. The Western Digital manual devotes a separate section to replacing a drive, providing the same clear explanations and detailed diagrams that we found in the drive addition section. Disc Wizard's customized instructions for the Seagate drives provide the best step-by-step procedures. Quantum's manual isn't bad, but it doesn't spell out the steps as explicitly as do the Western Digital and Seagate manuals. Apart from a brief section on backing up data, the IBM manual provides no advice related to drive replacement. The Fujitsu and Maxtor documentation is the least informative; it provides only a jumper setting for the stand-alone drive.

TECHNICAL SUPPORT

WE GRADED a company's support both on its policies, such as warranty and tech support hours, and on our actual experience with it. IBM stands out in terms of policies, with round-the-clock support. The rest of the companies keep regular weekday business hours; Western Digital has Saturday hours as well. All the vendors back their hard drives with long three-year warranties.

More important than a policy, however, is how well tech support actually performs. To find out, we called each companies' tech support several times and asked questions ranging from easy to difficult. Our favorite people to talk to were the technicians at Seagate. They knew their subject cold and were very patient. The Fujitsu and Maxtor representatives were also well prepared. Quantum and Western Digital folks handled our calls quickly, but their explanations were sometimes unclear. Our worst experiences were with IBM reps, who tended to be impatient.

All these companies maintain Web sites, but the sites at best contain a rehash of the manual. The Fujitsu site was the most disappointing, supplying only jumper diagrams and technical notes. We had better luck with the fax-back services. On the Fujitsu, IBM, Seagate, and Western Digital fax-back lines, we found clear menu options and useful information that clarified the explanations in the manual; the Maxtor and Quantum services were harder to navigate.

TEST REPORT

Maxtor, IBM Fastest Overall

The DiamondMax and DeskStar 4 ace our disk-intensive tests, but for general tasks, all drives perform about the same.

HARD DRIVES	Capacity (GB)	Spin rate (rpm)	Application test times (Faster ◀ ▶ Slower)
Maxtor DiamondMax 85120A	5.0	5400	
IBM Deskstar 4	4.2	5400	
IBM Deskstar 3	3.2	5400	
Seagate Medalist Pro 2520*	2.4	5400	
Western Digital Caviar 33100	3.1	5200	
Western Digital Caviar 22100*	2.1	5200	
Western Digital Caviar 32500	2.5	5200	
Fujitsu M1624TAU	2.2	5400	
Quantum Bigfoot CY 6.4	6.4	3600	
Fujitsu M1638TAU	2.5	5400	
Seagate Medalist 2132	2.1	4500	

*Best Buy

Time in minutes 0 5 10

Microsoft Access 7.0 Adobe Photoshop 3.0

HOW WE TEST We ran performance tests under Windows 95 on a Micron PowerStation Pentium-90 with 16MB of RAM and a 256K secondary cache. For the Access 7.0 test, we ran query, report, compact, and repair tasks on a 300,000-record 49MB database. For the Photoshop 3.0 test, we opened, flipped, and saved an 18MB image. Test results for 486-based PC and PC WorldBench business applications suite not shown.

TIP YOU'RE DISCHARGED! *Be sure to* GROUND *yourself by touching metal before you handle a hard drive. Static* ELECTRICITY *can damage a drive's electronics, so avoid touching the drive's* CIRCUIT BOARD *at all.*

FUTURE DEVELOPMENTS

EACH YEAR for the last two years, hard drives have doubled in size, and their cost per gigabyte has dropped by half. We see no letup in that trend. Hard drives won't become Plug and Play anytime soon, but partitioning will be simplified by Windows 95's successor, which is due out this summer. This version of Windows, codenamed Memphis, will include the FAT32 file system currently found only on some new PCs. (See "Getting the Most From Your Hard Drive.") Unlike FAT16, which limits single partitions to 2.1GB, FAT32 will let you make a single partition of up to 2048GB—which means partitioning will be simple for a long time. Software developers are updating their utilities and drivers to be FAT32-compatible; this should be mostly complete by year-end.

Bryan Hastings is a senior associate editor for PC World. *Amy Helen Johnson is a San Mateo, California–based writer who frequently contributes to computer publications.*

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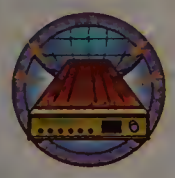
217 Graphics Boards

219 Modems



POWER-PACKIN' *portables*

BY REX FARRANCE

A NOTEBOOK COULD NEVER BE EVERYTHING a desktop is without sacrificing its portability. Can you imagine trying to balance a 17-inch screen on your knees, or lugging around a set of desktop speakers and a full-size keyboard? But for most computing tasks, size and cost are about the only compromises left for the notebook buyer.

PORTABLE POWER: The Gateway 2000 Solo 2100 S5-150 is as fast as some Pentium-166 desktops.

PHOTOGRAPHS MARC SIMON

The average desktop on our power and budget charts costs approximately $2500. The average power notebook costs about $1500 more. But a $4000 notebook comes close to doing everything a desktop can—and it's portable to boot. Today's notebooks come with the same multimedia and Internet components, including fast CD-ROM drives, reasonably good speakers, and high-speed modems. The biggest notebook screens are now about 12 inches—not much smaller than the viewing area of a typical 14-inch monitor, the desktop standard not that long ago. Need to connect your portable to a local area network? You can easily use a PC Card network adapter. Eventually, as more printers add infrared ports, you won't even have to plug your notebook into your printer.

NOTEBOOKS THAT FLY

EVEN PERFORMANCE doesn't limit notebooks the way it used to, thanks to advances like more powerful CPUs designed specifically for portable PCs, increased use of secondary caches, and local bus video. Within the last year or so, the difference in speed between power desktops and power notebooks has diminished steadily. Last April, the average Top 20 power desktop, a Pentium-166, was more than 40 percent faster than the average power notebook, a Pentium-120. Today the difference between the fastest desktop, a 200-MHz system, and the average power notebook, most often a Pentium-133, has shrunk down to about 25 percent.

In some superfast notebooks, you won't find even this performance difference. Two of this month's Best Buys, the Gateway 2000 Solo 2100 S5-150 and the Micron TransPort MRX Pentium-133, are as fast as or faster than desktops based on the same CPU. The Solo 2100, which uses a Pentium MMX-150 chip, is actually a tiny bit faster than the average Pentium-166 desktop we've tested. The TransPort is a little quicker than the average desktop Pentium-133—and only about 5 percent shy of the average desktop P-166.

THE BATTERY THAT WOULDN'T DIE

SINCE NOTEBOOKS WERE invented, designers have been trying to lengthen battery life: from the first nickel-cadmium rechargeables, to improved nickel–metal-hydride cells, to even better lithium-ion batteries. The latest wrinkle is a new kind of notebook power management, based on "heuristic" technology, a type of artificial intelligence. Notebooks using this technology are supposed to "learn" a user's power-usage patterns and manage the power accordingly.

The new AcerNote Nuovo, number six on our power chart this month, is the first notebook we've seen that uses this new technology. If our test results are any indication, heuristic power management is an important breakthrough in prolonging notebook battery life. Typical notebooks last from two to four hours per charge. The Acer lasted so much longer, we could not complete its testing in a workday. Finally, our tester showed up at 7 a.m. one morning and stuck with the Acer until it stopped running more than 11.5 hours later. The Nuovo operated much like other notebooks in our tests, entering sleep mode during periods of inactivity. But the end result was a battery life far longer than anything else we've ever seen.

DELL OPTIPLEX GXI 200: The first of Dell's corporate MMX PCs.

All notebooks may not be using "heuristic" power management by year's end, but just about all will go MMX. Gateway 2000's Solo 2100 S5-150, our new number-one power notebook, is the first Pentium MMX-150 notebook PC we've reviewed. Faster than any notebook we've tested, its PC WorldBench score of 199 stands up against powerful desktops like P-200s: The average P-200, with a PC WorldBench score of 210, beats the Solo 2100 S5-150 by only 6 percent. Our other new power notebook Best Buy, the Micron TransPort MRX Pentium-133, is no slouch either. With its 187 PC WorldBench score, it lags behind the average P-200 by less than 12 percent. The computing speed of these notebooks will please all but the most demanding users.

Three new Compaq notebooks also made our charts, giving the company a total of five portables on this month's Top 20. The new products range from the $5799 Compaq LTE 5400, a fast P-150 luxury model, to two Armada models that earned budget Best Buys. Number one is the Armada 1120, a no-frills P-100 notebook that's a fairly slow performer but costs just $1549. The otherwise similar Armada 1130T at number two provides a step up with a more powerful Pentium-120 CPU and an active-matrix color screen at a still-reasonable cost of $2299.

Recently, Compaq's Armada 4100 power adapters were recalled as potential fire hazards. Fortunately the safety of the Armada 1100 series adapters was never in doubt.

NEW DESKTOP ACTION

TWO OF THE Pentium MMX-200 desktops reviewed this month made our Power chart. The $3924 Dell OptiPlex GXi 200 debuts as our number five Best Buy. The OptiPlex GXi corporate line has replaced the discontinued GXMT models. The other new power system, the number 14 Royal P-200/MMX 3D, is the first Royal to make our Top 20. This fast $2795 system comes with a fine software bundle.

Two of this month's budget PCs also make our Top 20: The Kingdom 6x86

P166+ Value at number eight and the Diamond Mid Tower P166 at number 17. Both are bargains at $1579 and $1425, respectively; both use Cyrix's Cx686-P166+ processor; and both have PC WorldBench scores within a point or two of 200. The Diamond is a fairly generic model, with no software extras—though it comes with full multimedia and a fast modem. The Kingdom matches the Diamond's features and includes a good bundle of home and educational software.

ALPS' MD-2010 turns dry ink into great printouts.

This month we also reviewed a production version of the Monorail 7245 75-MHz home PC covered in the March *Top 5 Home PCs*. This all-in-one budget desktop system isn't much bigger than a briefcase and costs less than $1000—even with full multimedia and a modem. It was too slow to make the chart, though it came close. For more details, see PC World Online (http//www.pcworld.com/t20pcsnaps).

While preparing this article, we learned that Austin Computer Systems—a company whose PCs have appeared frequently in our Top 20s—had been acquired by an investment group. While we couldn't get a representative of this Austin, Texas direct-sales vendor to go on record, we'll report as soon as we can on the company's plans regarding continued marketing and support of its PCs.

PRINTING WITH DRY INK

THIS MONTH WE TESTED two printers that are capable of great output. The more unusual of the two is the $499 Alps MD-2010 Photo-Realistic Color Printer. It uses a dry ink technology and spooled, inked ribbons to output 1200-dpi images. The Alps' printouts come close to what you'd get from a monochrome or color laser printer, but it didn't make our charts. The Alps prints so slowly that we can't recommend it for general use. The second printer, Canon's LBP-465, ranks number four on the monochrome chart. The Canon laser's price is just $349, but its printout quality is actually better than our Best Buy's.

Rex Farrance is a senior associate editor for PC World. *Assistant Editor Allyson Bates, Editorial Researcher Julie Campagna, Staff Editors John Goddard and Eric Hellweg, Test Center Coordinator Andrew Hawn, Associate Editors Melissa Riofrio and JoAnne Robb, Contributing Editor James A. Martin, and freelance writers Jon Jacobi and Dan Littman contributed to the Top 100. Testing for the Top 100 by Ulrike Diehlmann, Jeffrey Kuta, Kevin Mitchell, Mike Salayko, and Susan Silvius. See page 14 for contact information.*

YOUR GUIDE TO THE TOP 100

QUESTIONS ABOUT OUR CHARTS? The following section should answer most of them. If not, ask us; see page 14 for contact information.

How do the charts work? The Top 20 and Top 10 charts are evolving lists of the best PCs, monitors, modems, printers, and graphics boards we've tested. Every month we test the latest products in each category and compare them to the pool of items we've already reviewed. As new products earn places on the charts, those at the bottom drop off. Price cuts also cause chart changes.

Where do you get your prices? We estimate street prices based on vendor information and our own research, including surveys of retail outlets. We recheck all prices every month.

What does the overall rating mean? It's the sum of all our tests—both hands-on evaluations and automated speed tests. The scale is 1 to 100, so a product that scores in the 90s is generally considered exceptional, one in the 80s is among the best, one in the 70s is above average, and one that scores lower usually doesn't place.

What does the PC WorldBench score mean? It's a measure of how fast a PC is in relation to our baseline machine, a Dell P75t configured with 8MB of RAM, a 540MB hard drive, and no secondary cache. A PC that scores 200, for instance, is twice as fast as the baseline unit.

Where do the reliability and service and support scores for PCs come from? The reliability score and the "service" portion of the service and support score come from readers who respond to the Reliability and Service fax-back survey in each issue of *PC World*. The "support" portion of the service and support score is based on the vendor's support policies (such as length of warranty and support hours).

What do all those word scores mean? Word scores for performance and price are based on a product's rating in relation to other products in its category. For example, a budget PC that is rated "expensive" is high-priced only in relation to other budget PCs. Likewise, a power notebook rated "good" for performance is good only in relation to other power notebooks. Word scores for other categories, such as features, are relative to all desktops or all notebooks.

Where can I find the online version of the Top 100? Go to PC World Online (http://www.pcworld.com). There you'll find not only the current issue of *PC World* and reviews for the last 18 months, but some extra features you'll want to check out. For one thing, PC World Online includes reviews you won't find in print. If a product misses a chart and we don't cover it here, you can go directly to an online review by using the URL provided in each Top 100 section.

Have you ever wished you could build your own chart based on your buying criteria? Now you can, with Personal Shopper at our Web site. Personal Shopper combines your criteria with *PC World*'s current data and test results to generate customized Top 20s and Top 10s. For instance, if you want your chart to rank notebooks that have 120-MHz processors and 28.8-kbps modems, Personal Shopper will find and rank all the machines that fit your specifications.

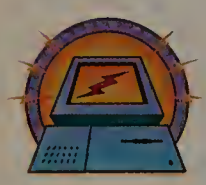
PC WORLD

TOP 20 POWER DESKTOPS

	SYSTEMS	Last month	Month tested	Street price (1/9/97)	CPU	Comments
1	Dell Dimension XPS M200S 800/388-8542 www.dell.com	1	Mar 97	$2699	Pentium MMX-200	Dell's MMX Dimension has superb price; outperforms Pentium Pro sibling.
2	Dell Dimension XPS Pro200n 800/388-8542 www.dell.com	2	Jan 97	$3179	Pentium Pro-200	$170 off on fast, feature-packed minitower. Easy to open and upgrade.
3	Dell OptiPlex GXpro 200 800/388-8542 www.dell.com	3	Aug 96	$3910	Pentium Pro-200	Price is $208 higher; now has 33.6-kbps modem, bigger 3.2GB hard drive.
4	Micron Millennia Pro2 200 B 888/634-8799 www.mei.micron.com	4	Feb 97	$2938	Pentium Pro-200	Fast, loaded minitower. Micron's PC reliability rating still down from best.
5	Dell OptiPlex GXi 200 800/388-8542 www.dell.com	–	NEW	$3924	Pentium MMX-200	First of Dell's corporate MMX PCs replaces discontinued OptiPlex GXMT 5200.
6	Gateway 2000 P5-200 FPC 800/846-2000 www.gw2K.com	5	Sept 96	$2519	Pentium-200	Quick, loaded, good price; but reliability rating could be higher.
7	Gateway 2000 G6-200 800/846-2000 www.gw2K.com	7	Dec 96	$2819	Pentium Pro-200	Price up $220; now has workgroup server-grade SCSI adapter.
8	Micron Home MPC P200 888/634-8799 www.mei.micron.com	9	Mar 97	$3158	Pentium-200	Home software bundle makes it family-friendly; price down $179.
9	HP Vectra VA 6/200 MT 800/752-0900 www.hp.com	10	Mar 97	$3474	Pentium Pro-200	Great corporate PC, but support hours are limited.
10	HP Pavilion 7285 800/724-6631 www.hp.com	11	Jan 97	$3148	Pentium-200	Performs well, large hard disk, voice modem; one-year warranty.
11	HP Vectra VL 5/200MT Series 4 800/752-0900 www.hp.com	18	Sept 96	$2849	Pentium-200	Well-built, but support hours are limited. Pentium-166 version also good.
12	Quantex QP5/200 SM-3 800/896-4898 www.quantex.com	14	Mar 97	$2699	Pentium MMX-200	Great deal for MMX PC, but system reliability rating is back to poor.
13	IBM PC 350 P-200 800/426-2968 www.pc.ibm.com	13	Sept 96	$3321	Pentium-200	Great network machine includes Universal Serial Bus ports.
14	Royal P-200/MMX 3D 800/486-0008 www.royalcomp.com	–	NEW	$2795	Pentium MMX-200	Fast MMX PC. Lots of software, 3-D video; one-year parts warranty.
15	IBM PC 365 800/426-2968 www.pc.ibm.com	20	Mar 97	$5124	Pentium Pro-200	Expensive but has rewritable optical drive. System reliability rating down.
16	Compaq Presario 4716 800/345-1518 www.compaq.com	19	Feb 97	$2648	Pentium-200	Sturdy, packs lots of features, but PC reliability rating is down a bit.
17	Netis N6200PCI 800/577-7526 www.netistech.com	25	Dec 96	$2850	Pentium Pro-200	Can take two CPUs; fast, cheap for a Pentium Pro; $70 price drop.
18	Sys Technology Performance Pro 200 800/613-9963 www.systechnology.com	23	Dec 96	$2979	Pentium Pro-200	Superfast; good graphics card; $50 price drop. Otherwise fairly generic.
19	CyberMax Promax 2 PP200 800/443-9868 www.cybmax.com	26	Mar 97	$2599	Pentium Pro-200	Low-cost, well-configured speedster. No service turnaround policy.
20	Digital Celebris GL 6200 800/344-4825 www.windows.digital.com	27	Mar 97	$4315	Pentium Pro-200	Expensive, well-designed corporate PC with built-in networking.

Best Buy See features chart, page 184; performance chart, page 188. Recommended as home system

[1] To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews ($9.95, available March 26).



TO THE SWIFTEST GO THE SPOILS, as you can see from the preponderance of high-powered systems on our Power chart this month: Price cuts have turned the last of the Pentium-166 PCs, including March's number six Micron Millennia P166, into affordable budget machines. Among the hopefuls that didn't make the chart are a couple of fast, well-designed home office PCs from NEC and Sony. Despite attractive software bundles and extras like an internal Zip drive on the NEC, their relatively high cost spoiled their chances (though the NEC system barely missed the chart). For more details, see PC World Online (http://www.pcworld.com/t20pcsnaps).

SCORECARD

★ Overall rating	PC WorldBench score/performance	Vendor's system reliability	Features and design	Price	Vendor's support quality/policies	Fax reprint number[1]	Reader service number
95	234/outstanding	best	outstanding	inexpensive	best/best	3494	601
93	230/very good	best	outstanding	average	best/best	3474	602
91	232/outstanding	best	outstanding	expensive	best/best	3401	603
90	231/outstanding	good	outstanding	average	best/best	3487	604
89	225/very good	best	outstanding	expensive	best/best	3506	605
89	208/very good	fair	outstanding	inexpensive	best/best	3418	606
88	234/outstanding	fair	outstanding	average	best/best	3458	607
88	216/very good	good	outstanding	average	best/best	3495	608
87	229/very good	best	outstanding	average	good/poor	3496	609
87	207/good	best	outstanding	average	good/fair	3475	610
84	201/good	best	very good	average	good/poor	3421	611
84	227/very good	poor	outstanding	inexpensive	fair/best	3497	612
84	215/very good	fair	outstanding	average	good/good	3422	–
83	232/outstanding	[2]	outstanding	average	[2]/fair	3507	613
83	232/outstanding	fair	outstanding	very expensive	good/good	3500	–
83	202/good	good	outstanding	inexpensive	fair/good	3499	614
83	230/very good	[2]	outstanding	average	[2]/fair	3460	615
82	236/outstanding	[2]	outstanding	average	[2]/poor	3459	616
82	232/outstanding	[2]	outstanding	inexpensive	[2]/fair	3508	617
82	229/very good	fair	outstanding	expensive	fair/good	3509	618
Scorecard weightings ▶	Performance 25 percent	Reliability 25 percent	Features 20 percent	Price 15 percent	Support 15 percent	All products:	901

[2] Insufficient data.

This Month's Best Buys

1 DELL DIMENSION XPS M200S

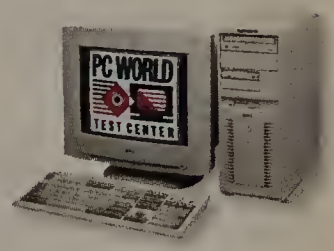
PRO: Performs like a Pentium Pro; 33.6-kbps modem; best reliability and support

CON: Total RAM is limited to 64MB

The first Dell Dimension to use Intel's new Pentium MMX-200 processor, the Dimension XPS M200S claims the number one Best Buy spot on our Power Desktops chart for the second month in a row, with a winning combination of speed, high-quality components, good design, and great service.

The M200S is as fast as a Pentium Pro—and only 1 percent slower than Gateway's P55C-200M preproduction MMX system, the fastest PC we've ever tested (see *Top of the News*, February). But at $2699, it's not priced like a Pentium Pro.

The XPS M200S features the same high-quality design as other Dimension minitower models. It has an easy-open case and an easy-to-navigate motherboard. The wide base at the bottom of the system case keeps it stable and upright. Dell throws in some nice extras with this configuration, such as Microsoft Office Professional, a couple of Altec Lansing ACS 290 speakers with a subwoofer, plus a 33.6-kbps telephony modem.



Dell XPS M200S

This PC's 4MB Matrox Millennium card isn't as appropriate for high-end graphics tasks as Dell's workstation-class graphics card, the Number Nine Imagine 128 Series 2. But the Matrox is fine for most graphics chores and costs about $300 less. Keep in mind that like all the other Dimensions that use SDRAM, the M200S is limited to 64MB of system memory—only half the amount most other PCs can take. Although 64MB sounds like a lot, users of programs such as Photoshop and other demanding graphics software might want to be able to add more memory.

The case is easy to open. Give a thumbscrew a few turns, and off comes the side panel to reveal a clean interior with a fair number of free slots and bays. All the cable connectors sit right below the drive cage, which means you're not faced with the usual maze of ribbon cables obstructing the slots. Overall, the M200S is just about everything you could want in a top-of-the-line PC. With its MMX performance, top-speed CD-ROM drive, roomy hard drive, and fast voice-enabled fax-modem that you can also use as an answering machine, this Dimension should satisfy most users' requirements for at least a couple of years.

Dell's system documentation is thorough and easy to understand, and the company's support policies are superb. PC reliability ranks among the best too, according to *PC World* readers. Of dozens of fax-back responses we get from Dell owners each month, few complain about system problems. ▶

TOP 20 POWER DESKTOPS — STANDARD FEATURES

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/ viewable diagonal (inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension XPS M200S*	Pentium MMX-200	32	512	3.2	Matrox Millennium	4/WRAM	17/15.8	.28	12X
2	Dell Dimension XPS Pro200n*	Pentium Pro-200	32	256	3.2	Number Nine Imagine 128 Series 2	4/VRAM	17/15.6	.28	12X
3	Dell OptiPlex GXpro 200*	Pentium Pro-200	32	256	3.2	Number Nine Imagine 128 Series 2	4/VRAM	17/15.6	.28	8X
4	Micron Millennia Pro2 200 B*	Pentium Pro-200	32	256	3.1	Diamond Stealth 3D 2000	4/DRAM	17/16	.26	12X
5	Dell OptiPlex GXi 200*	Pentium MMX-200	32	512	3.2	Number Nine Imagine 128 Series 2	2/EDO DRAM	17/16	.28	8X
6	Gateway 2000 P5-200 FPC	Pentium-200	32	512	3	Matrox Millennium	2/WRAM	17/15.9	.26	12X
7	Gateway 2000 G6-200	Pentium Pro-200	32	256	2.1	Matrox Millennium	4/WRAM	17/15.9	.25	12X
8	Micron Home MPC P200	Pentium-200	32	512	3.1	Diamond Stealth 3D/Monster 3D	4/EDO DRAM	17/16	.26	12X
9	HP Vectra VA 6/200 MT	Pentium Pro-200	32	256	2.5	Matrox Millennium	2/WRAM	17/15.7	.28	8X
10	HP Pavilion 7285	Pentium-200	32	256	3.2	S3 Virge PCI	2/EDO DRAM	17/15.5	.28	8X
11	HP Vectra VL 5/200MT Series 4	Pentium-200	16	256	2.5	Matrox Millennium	2/WRAM	15/13.5	.28	8X
12	Quantex QP5/200 SM-3	Pentium MMX-200	32	512	3.2	Matrox Millennium	4/WRAM	17/16	.25	12X
13	IBM PC 350 P-200	Pentium-200	32	512	1.6	integrated Trio64V+	2/EDO DRAM	17/15.5	.28	6X
14	Royal P200/MMX 3D	Pentium MMX-200	32	512	2.5	ATI 3D Pro Turbo	4/SGRAM	17/16	.25	12X
15	IBM PC 365	Pentium Pro-200	32	256	2.1	Matrox Millennium	4/WRAM	17/15.7	.28	6X
16	Compaq Presario 4716	Pentium-200	32	256	2.6	integrated S3 Virge	2/DRAM	15/13.6	.28	8X
17	Netis N6200PCI	Pentium Pro-200	32	256	2.1	Matrox Millennium	2/WRAM	17/15.1	.28	6X
18	Sys Performance Pro 200	Pentium Pro-200	32	256	2.5	Matrox Millennium	2/WRAM	17/15	.28	8X
19	CyberMax Promax 2 PP200	Pentium Pro-200	32	256	3.2	Matrox Millennium	4/WRAM	17/15.5	.28	12X
20	Digital Celebris GL 6200	Pentium Pro-200	32	256	2.1	integrated MGA-2064W	4/WRAM	17/16.1	.28	8X

* Best Buy [1] Five years on CPU and main RAM, three years on other parts. [2] Toll call.

2 DELL DIMENSION XPS PRO200N

PRO: Very fast; 33.6-kbps modem; top reliability; excellent service and support policies

CON: None significant

The XPS Pro200n is a powerful machine that would be a superb choice for a Windows NT workstation, thanks to its Pentium Pro-200 CPU. Depending on your needs, you can buy this system with either NT or Windows 95. We reviewed a Win 95 machine, and it was just a little bit slower than the number one XPS M200S. Because of the Pro-200n's more expensive processor and graphics card, it costs $480 more (though its price dropped $170 this month).

Dell XPS Pro200n

This fast $3179 system has the same minitower case style as the M200S. The CD-ROM drive is located at the top of the front panel, making it easily accessible, and the power and reset buttons lie in the center of the panel, well away from the floppy disk eject button. The interior needs better ventilation, however; the heat sink singed our hands when we touched it, despite the presence of a big cooling fan. More air could circulate through the case if the hard drive were mounted farther away from the front grille.

The support policies on this system are exactly the same as those of its Dimension XPS M200s sibling.

3 DELL OPTIPLEX GXPRO 200

PRO: Speedy, great design, built-in networking

CON: Application software not included in price

Like the number one and number two Dells on the Power Desktops chart, the OptiPlex GXpro 200 is one of the fastest PCs we've tested. With its built-in LAN adapter and easy-to-upgrade interior, it's also designed to work well in a corporate environment.

Since we last reviewed it, Dell gave the GXpro 200 a fast modem and a bigger hard drive. At $3910 the system is more expensive than ever, but the $208 increase is typical for an upgrade to a 33.6-kbps modem and a 3.2GB hard drive. It also comes with expensive—and top-notch—graphics hardware: a Number Nine Imagine 128 Series 2 graphics card with 4MB

		EXPANDABILITY						CUSTOMER SUPPORT			
Modem speed (kbps)	Sound board	Case style	Max. RAM (MB)	Maximum secondary cache (K)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
33.6	integrated Vibra 16	minitower	64	512	1	2/1	3	3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	Sound Blaster AWE32 (OEM)	minitower	128	512	2	3/1	4	3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	integrated Vibra 16	desktop	512	256	3	1/1	4	3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	integrated Sound Blaster 16	minitower	512	512	3	3/0	4	3 [1]/1	24	Sat., Sun.	CIS, WWW
33.6	integrated Vibra 16	desktop	512	512	3	1/0	4	3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	Ensoniq Soundscape Vivo	tower	128	512	1	2/6	2	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	Sound Blaster 16 PnP	tower	256	256	2	3/6	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	Sound Blaster AWE32	minitower	128	512	2	3/1	3	3 [1]/1	24	Sat., Sun.	CIS, WWW
–	Sound Blaster 16 PnP	minitower	192	256	4	2/1	4	3/3	11 [2]	–	AOL, BBS, CIS, WWW
28.8	integrated 16-bit	minitower	128	256	2	2/3	6	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
–	Sound Blaster 16	minitower	128	512	4	2/1	4	3/3	11 [2]	–	AOL, BBS, CIS, WWW
33.6	Ensoniq Soundscape Vivo	minitower	128	512	2	3/2	4	3/1	24	Sat., Sun.	BBS, Prodigy, WWW
–	–	desktop	192	512	4	1/1	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	ESS AudioDrive 1B6B	minitower	128	512	3	3/1	3	1/lifetime	10	Sat.	BBS, WWW
–	–	desktop	512	256	3	0/1	3	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	integrated 16-bit	minitower	128	512	0	2/0	5	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	Sound Blaster 16 PnP	tower	256	512	6	3/0	5	1/3	10	Sat.	BBS, WWW
28.8	Sound Blaster 32 PnP	minitower	128	512	2	3/1	4	1/1	24	Sat., Sun.	–
33.6	Ensoniq Soundscape Vivo PnP	minitower	128	512	2	3/2	4	3/1	12	Sat.	BBS, WWW
28.8	integrated MGA-2064W	minitower	192	256	4	2/1	4	3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW

of VRAM, and a bright, crisp 17-inch Dell D1728D monitor.

Although the GXpro provides multimedia components, including integrated sound and speakers, don't expect the ultimate multimedia experience. Dell put most of the muscle behind this Pentium Pro-200 into a LAN connection and an interior design network administrators will love. The GXpro is one of the easiest-to-upgrade PCs we've seen, with fine touches the Dimension models don't match. The case is simple to remove, and the internal construction is modular. Cards are housed on a vertical riser plane that slides out at the touch of a lever. Even the power supply swings aside for effortless access to the motherboard and drive bays. (An easily upgradable tower version of the GXpro is also available.)

Dell GXpro 200

The GXpro uses the newer dual in-line memory modules rather than SIMMs. People who service PCs love DIMMs because they allow easy memory expansion without forcing you to remove lower-capacity modules to make room. The OptiPlex GXpro has four DIMM sockets instead of the usual two. This leaves three sockets open, so graphics professionals and other users who need lots of RAM can fill 'er up. This OptiPlex also comes with the same three-year warranty, round-the-clock tech support, and high reader ratings for reliability and service as the Dimensions on our chart.

4 MICRON MILLENNIA PRO2 200 B

PRO: Very fast performance, highly rated modem, second processor socket, Microsoft Office, good reliability rating

CON: Long waits for technical support

Micron's Millennia Pro2 200 B is the system for you if you need high-quality components and a built-in upgrade path to the world of dual processing. The $2938 price for this minitower is $100 higher than the price that was listed last month, when the company forgot to account for the 33.6-kbps modem, an internal U.S. Robotics Sportster, one of the best models in recent *PC World* tests. At 3.1GB, the system's hard drive is 1GB bigger than last month's drive. A nice pair of Advent AV007 speakers, an integrated Sound Blaster 16, ▶

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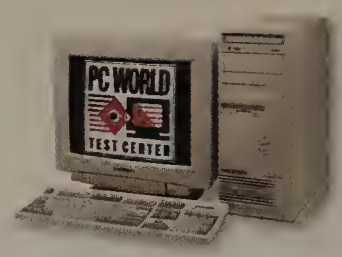
One clever idea after another. That's Plymouth.

and a fast CD-ROM drive make for a good, if not great, multimedia setup.

The Millennia Pro2's Intel motherboard includes a CPU socket for adding another Pentium Pro-200 processor, a rare but useful option that will allow multiprocessing if you use an operating system that supports it, such as Windows NT. The system's DIMM sockets are capable of holding twice as much memory as SIMM sockets. In addition, you can install DIMMs singly, whereas SIMMs must plug in two at a time. The Micron's RAM ceiling is 512MB—generous, but far more than most users will ever need.



Micron Pro2 200 B

The Millennia Pro2's PC WorldBench score of 231 puts it in the upper echelon of high-performance systems. Micron rates well for PC reliability and support. The Millennia's warranty covers the CPU and main RAM for five years and other parts for three. You also get free on-site service for the first year, and round-the-clock toll-free technical support. We've found the phone support to be good once you get through, but lately we consider it lucky if we manage to reach a support person in less than 45 minutes. ▶

TOP 20 POWER DESKTOPS

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score
1	Dell Dimension XPS M200S*	Pentium MMX-200	32	512	234
2	Dell Dimension XPS Pro200n*	Pentium Pro-200	32	256	230
3	Dell OptiPlex GXpro 200*	Pentium Pro-200	32	256	232
4	Micron Millennia Pro2 200 B*	Pentium Pro-200	32	256	231
5	Dell OptiPlex GXi 200*	Pentium MMX-200	32	512	225
6	Gateway 2000 P5-200 FPC	Pentium-200	32	512	208
7	Gateway 2000 G6-200	Pentium Pro-200	32	256	234
8	Micron Home MPC P200	Pentium-200	32	512	216
9	HP Vectra VA 6/200 MT	Pentium Pro-200	32	256	229
10	HP Pavilion 7285	Pentium-200	32	256	207
11	HP Vectra VL 5/200MT Series 4	Pentium-200	16	256	201
12	Quantex QP5/200 SM-3	Pentium MMX-200	32	512	227
13	IBM PC 350 P-200	Pentium-200	32	512	215
14	Royal P-200/MMX 3D	Pentium MMX-200	32	512	232
15	IBM PC 365	Pentium Pro-200	32	256	232
16	Compaq Presario 4716	Pentium-200	32	256	202
17	Netis N6200PCI	Pentium Pro-200	32	256	230
18	Sys Technology Performance Pro 200	Pentium Pro-200	32	256	236
19	CyberMax Promax 2 PP200	Pentium Pro-200	32	256	232
20	Digital Celebris GL 6200	Pentium Pro-200	32	256	229

*Best Buy

Word 7.0 for Windows 95
Excel 7.0 for Windows 95
Picture Publisher 6.0 for Windows 95
Paradox 5.0 for Windows
WordPerfect 6.1 for Windows
1-2-3 release 5 for Windows

HOW WE TEST All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details, visit PC World Online (http://www.pcworld.com/t20pcsnaps).

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5 DELL OPTIPLEX GXI 200

PRO: Fast; hot graphics; best reliability, support

CON: Expensive; fairly limited expandability

Like other PCs in the OptiPlex line, the GXi 200 is all business. This is the first of Dell's MMX OptiPlex PCs, and it replaces the Best Buy OptiPlex GXMT 5200 discontinued last month. This new system is fast and has built-in networking and sound and some of the best reliability and support you can get. With a Pentium MMX-200 under its hood, it cruises to a PC WorldBench score of 225—just 5 percent slower than the fastest PC we've tested, and 7 percent faster than the average P-200.

Like all top-of-the-line OptiPlex models, the $3924 GXi 200 is not for the faint of budget. Price is one major difference between the Dimension and OptiPlex lines: This system costs a whopping $1225 more than the Dimension XPS M200S, the number one power desktop machine. But cost isn't the only difference between the OptiPlex and Dimension families. Higher-end OptiPlex systems are designed with networks in mind: They come with integrated ethernet adapters, and they plug into a LAN right out of the box. In addition, major system components, such as the Number Nine Imagine 128 Series 2 video card, go through extra testing to ensure driver compatibility.

The 17-inch Dell D1728D-LS monitor provides you with bright colors and clear, crisp graphics and text. But it isn't Dell's best. For an extra $100, you can get a 17HS Trinitron display. The integrated 16-bit sound is good for a business PC, but some corporate buyers may well leave out the basic Altec Lansing ACS 90 speakers and save $49. Dell doesn't stint on quality when it comes to the 33.6-kbps U.S. Robotics telephony modem. Dell even includes a Universal Serial Bus port for hooking up USB peripherals.

Dell GXi 200

This system is intelligently designed and put together. The thumbscrew-secured desktop case is sturdy and easy to open. The expansion slots sit on a daughtercard located above the motherboard, making the expansion card upgrade process about as painless as it can be. But with only one available external drive bay, the ability to add to your storage is fairly limited. And the three available DIMM memory sockets are sequestered behind snaking cables, making them somewhat hard to reach. Memory expandability extends all the way up to 512MB, a ceiling few will ever reach. As is usual with Dell machines, the system's documentation is nicely illustrated, easily understood, and well organized. The on-screen documentation is helpful.

New This Month

The following PC made our Power Desktops chart for the first time this month. For previously tested PCs on the chart, visit our Web page at http://www.pcworld.com/t20pcs.

14 ROYAL P-200/MMX 3D

PRO: Fast, great software, terrific speakers

CON: Messy interior

Royal's P-200/MMX 3D is an attractive combination of great performance, good components, and useful software. It will impress home office buyers, graphic designers, and even serious gamers. With the help of Intel's latest, the Pentium MMX-200 CPU, the Royal turned in great test results: a PC WorldBench score of 232. That puts this machine within 2 percent of the fastest system we've ever tested. In fact, the company's unverified track record on reliability and service is the only thing that kept this $2795 system from climbing higher on our Power chart.

If you add a joystick, this PC would make a fine gaming machine. The ATI 3D Pro Turbo graphics board with 4MB of SGRAM accelerates video and 3-D rendering to allow seamless transitions in graphics programs and extra sizzle in your favorite games. And the Mitsumi 12X CD-ROM drive will run the most intensive 3-D games with performance to spare. Royal matched the graphics card with a high-quality monitor: The 17-inch Utopia XP400 has a spacious 16-inch diagonal viewable area and a fine .25mm dot pitch that translates into a good-looking display. To cap off the multimedia experience, the Cambridge Sound Works speakers put out some of the best sounds we've heard from a PC. And the ESS AudioDrive 1868 sound card is a full-duplex model that lets you do simultaneous recording and playback—a necessity if you want to use your PC for digital recording.

Royal throws in a game sampler to whet your appetite, but you'll have to buy your own games. Otherwise, the software bundle ranges from the useful to the essential: You get VocalTec Internet Phone, IBM Voice Type Voice Navigation & Control, and the Infopedia encyclopedia. Bitware and the usual introductory offers to America Online, CompuServe, and other information service providers complement the 33.6-kbps internal modem. But the real gems of the bundle are Quicken SE and Microsoft's Office Professional and Bookshelf.

Do-it-yourself types won't like the disordered interior, where an unruly collection of cables makes it difficult to access all the memory sockets and expansion slots. However, the drive bays are easy to get to.

Royal P-200/MMX

Royal's support policies could be better: Toll-free tech support is available just 10 hours a day, and there's no support on Sundays. And the one-year warranty on parts doesn't add much value. Anonymous calls to Royal's technicians produced mixed results: They correctly answered our hardest questions but flubbed our easiest. Royal has automated 24-hour fax-back support but it's not toll-free. Still, the P-200/MMX 3D is a good, fast PC that has the right stuff. ▶

Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Power Desktops chart. For write-ups, see PC World Online (http://www.pcworld.com/t20pcsnaps).

- **CompuLink Infinity P-200 MMX**
- **NEC Ready Office 1625**
- **Sony VAIO PCV-70**
- **Vektron P166 MMX**

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PC WORLD

TOP 20 BUDGET DESKTOPS

	SYSTEMS	Last month	Month tested	Street price (1/9/97)	CPU	Comments
1	Dell Dimension P133v 800/388-8542 www.dell.com	1	Dec 96	$1879	Pentium-133	Fast; sound and modem are perks at this price. Good first PC.
2	Micron Millennia LXA P133 888/634-8799 www.mei.micron.com	2	Jan 97	$1649	Pentium-133	As fast as some P-166s, but reliability rating keeps it from top. $100 price drop.
3	Gateway 2000 P5-133 800/846-2000 www.gw2K.com	3	Nov 96	$1599	Pentium-133	$100 price cut on quick P-133 with fast graphics card; sound costs extra.
4	Dell OptiPlex GS+ 5200L 800/388-8542 www.dell.com	4	Feb 97	$2282	Pentium-200	Not as fast as most P-200s, but has built-in LAN adapter. $172 price drop.
5	Gateway 2000 G6-180 800/846-2000 www.gw2K.com	6	Dec 96	$2039	Pentium Pro-180	Very fast; with a modem, it would be perfect in the home. $140 price drop.
6	HP Vectra VE 5/133 800/752-0900 www.hp.com	8	Dec 96	$1986	Pentium-133	Corporate P-133 with clean design. Unified Memory Architecture slows it down.
7	HP Vectra XM 5/120 Series 4 800/752-0900 www.hp.com	9	Oct 96	$1828	Pentium-120	Well-built corporate PC backed by great reliability rating; short support hours.
8	Kingdom 6x86 P166+ Value 800/385-3436 www.kingdomcomputers.com	–	NEW	$1597	Cx6x86-P166+	Lots of value for the money, very good performance; poor manual.
9	Quantex QP5/166 SM-2 800/896-4898 www.quantex.com	10	Aug 96	$2099	Pentium-166	$200 price drop; if reliability rating were better it would be a Best Buy.
10	DirectWave Blue Thunder P133 MVP Pro 800/882-8108 www.directwave.com	22	Oct 96	$1597	Pentium-133	$100 drop puts fast, well-built PC back on chart; limited support hours.
11	Vektron Home Office P133 800/725-0026 www.vektron.com	15	Mar 97	$1495	Pentium-133	Fairly generic, but fast and has one of lowest prices here. $200 drop.
12	AST Advantage 9304 800/876-4278 www.ast.com	19	Dec 96	$1399	Pentium-133	$200 price cut makes for great deal. Integrated wavetable sound.
13	CyberMax Cyrix Max C3 P166+ 800/443-9868 www.cybmax.com	11	Feb 97	$1649	Cx6x86-P166+	$50 price drop; our PC had 24MB of RAM, but company now sells it with 32MB.
14	IBM PC 350 P-166 800/426-2968 www.pc.ibm.com	5	Dec 96	$2364	Pentium-166	Corporate PC's a good value but lacks sound. IBM PC reliability rating down.
15	Compaq Presario 4402 800/345-1518 www.compaq.com	7	Jan 97	$1799	Pentium-133	Not very fast or expandable, but reliability rating is still good.
16	Quantex QP6/200 Pro-4 800/896-4898 www.quantex.com	12	Aug 96	$2199	Pentium Pro-200	$200 drop should wow home PC buyers; reliability could be better.
17	Diamond Mid Tower P166 800/989-7253 www.diamondtech.com	–	NEW	$1425	Cx6x86-P166+	Bargain generic PC has 3-D graphics but a mediocre monitor.
18	First Computer FCS P-133 800/325-1911 www.fcsnet.com	26	Aug 96	$1399	Pentium-133	Huge $300 price drop puts superinexpensive, quick multimedia P-133 on chart.
19	ProGen Discover MPEG II P150 888/776-9595 www.progen.com	13	Nov 96	$1449	Pentium-150	$50 off on well-built PC. Good option for game players on a budget.
20	Compaq Deskpro 2000 Model 5200/1080 800/345-1518 www.compaq.com	–	Nov 96	$2459	Pentium-200	$240 price drop on quick business PC. No sound; reliability rating down a bit.

Best Buy See features chart, page 194; performance chart, page 198. Recommended as home system

[1] To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews ($9.95, available March 26).

OVERALL, PENTIUM-133 PCs are still the best value in budget systems. But you'll find everything from Pentium-150 to Pentium Pro-200 machines on our Budget chart these days. Most unusual budget PC we tested this month: the Monorail 7245, an under-$1000 system the size of a carry-on bag. Monorail keeps the price of this complete, Internet-ready PC down by using a combination of desktop and notebook components. The system's dual-scan notebook screen and slow 75-MHz speed kept it off the chart, but its low price, easy setup, and multimedia components might appeal to people who want a cheap basic system. For more details, see PC World Online (http://www.pcworld.com/t20pcsnaps).

SCORECARD

★ Overall rating	Price	Vendor's system reliability	Features and design	PC WorldBench score/performance	Vendor's support quality/policies	Fax reprint number[1]	Reader service number
92	average	best	outstanding	188/very good	best/best	3462	619
91	inexpensive	good	outstanding	191/very good	best/best	3479	620
87	inexpensive	fair	very good	192/very good	best/best	3449	621
87	expensive	best	very good	201/very good	best/best	3501	622
85	average	fair	outstanding	218/outstanding	best/best	3466	623
83	average	best	very good	166/good	good/poor	3465	624
83	average	best	good	177/good	good/poor	3455	625
83	inexpensive	[2]	outstanding	202/very good	[2]/fair	3510	626
83	average	poor	outstanding	209/very good	fair/best	3404	627
83	inexpensive	[2]	outstanding	194/very good	[2]/good	3469	628
83	inexpensive	[2]	outstanding	188/very good	[2]/fair	3504	629
82	very inexpensive	poor	very good	189/very good	fair/good	3490	630
82	inexpensive	[2]	outstanding	205/very good	[2]/fair	3511	631
82	expensive	fair	outstanding	197/very good	good/good	3468	–
82	average	good	very good	153/good	fair/good	3481	632
82	average	poor	outstanding	224/outstanding	fair/best	3405	633
82	very inexpensive	[2]	very good	199/very good	[2]/poor	3512	634
82	very inexpensive	[2]	very good	189/very good	[2]/fair	3513	635
81	inexpensive	[2]	very good	183/very good	[2]/fair	3451	636
81	expensive	good	outstanding	218/outstanding	fair/best	3442	637
Scorecard weightings ▶	Price 25 percent	Reliability 25 percent	Features 20 percent	Performance 15 percent	Support 15 percent	All products:	902

[2] Insufficient data.

This Month's Best Buys

1 DELL DIMENSION P133V

PRO: Fast, well designed, top reliability rating

CON: Limited RAM expandability

You can buy faster machines, but you can't find a better combination of support, reliability, and good design than Dell's "v" line of basic PCs for first-time and budget buyers. The Dell Dimension P133v is a powerful multimedia minitower that offers good performance and features for only $1879. Its PC WorldBench score of 188 is very good for a Pentium-133. Our test model even came with a 16-bit sound card, something you don't usually get with a bare-bones Dell PC. (Speakers cost extra.) The system also includes a 33.6-kbps fax-modem.

The 15-inch Dell 15TX Trinitron monitor displays crisp images and text. The one that came with our test system was a little dark and couldn't be brightened, although none of the other Dell 15TX monitors we've tested have had this fault.

Dell P133v

The "v" series PCs are nicely designed and well put together. The case is easy to open via latches and thumbscrews, and there are two cooling fans to ensure you don't fry your investment. The external ports are well labeled. For expanding memory, the P133v uses DIMMs, which hold more memory on a module than SIMMs. The system's two 32MB DIMM sockets can hold no more than 64MB of synchronous RAM—a low limit these days, although it will probably be more than enough for most users.

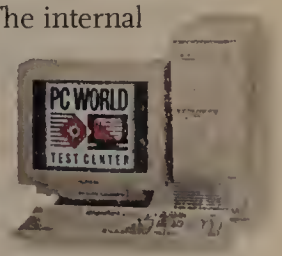
This month we also looked at a fuller configuration of Dell's Dimension P200v, which we first reviewed in November. With a $139 upgrade to 32MB of RAM, a 33.6-kbps modem, and full multimedia, this $2299 system is nicely set up for the home office. It earned a PC WorldBench score of 213, 13 percent faster than the P133v's and about 6 percent faster than the more sparsely configured November system. Otherwise, the machine is the same as the P200v we examined earlier, with a 15-inch Dell 15LS monitor, and now a 2.1GB hard drive. If you want to step up to Dell's 15-inch Trinitron, add $49 to the price. The warranty is the same as for the Dimension P133v: three years' coverage on parts and one year on labor.

2 MICRON MILLENNIA LXA P133

PRO: Fast, well built, $100 price drop

CON: No modem, no software bundle

The $1649 Micron Millennia LXA P133 performs as well as many P-166s. You'll need to add only a modem and applications to make it a complete package. The internal design of this minitower is spare, clean, and open, and the motherboard is very easily accessible, so adding cards or ▶



Micron LXA P133

TOP 20 BUDGET DESKTOPS — STANDARD FEATURES

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/ viewable diagonal (inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension P133v*	Pentium-133	16	256	2.1	integrated S3 Trio64V+	2/EDO DRAM	15/14	.25	12X
2	Micron Millennia LXA P133*	Pentium-133	16	512	2.1	Diamond Stealth 30 2000	4/EDO DRAM	15/13.5	.28	12X
3	Gateway 2000 P5-133*	Pentium-133	16	256	2	ST8 Lightspeed 128	2/MDRAM	15/13.9	.28	8X
4	Dell OptiPlex GS+ 5200L*	Pentium-200	16	256	2.1	integrated S3 Trio64V+	2/VRAM	15/13.7	.28	8X
5	Gateway 2000 G6-180*	Pentium Pro-180	16	256	3.2	ST8 Lightspeed 128	2/MDRAM	15/13.9	.25	8X
6	HP Vectra VE 5/133	Pentium-133	16	256	1.1	integrated SiS 6205	2/EDO DRAM	15/14	.28	8X
7	HP Vectra XM 5/120 Series 4	Pentium-120	16	512	1.3	integrated S3 Trio64	2/DRAM	15/13.5	.28	–
8	Kingdom 6x86 P166+ Value	Cx6x86-P166+	32	512	2.1	S3 765	2/DRAM	15/13.8	.28	12X
9	Quantex QP5/166 SM-2	Pentium-166	32	512	2.5	ST8 Lightspeed 128	2/MDRAM	17/15.9	.26	12X
10	DirectWave Blue Thunder P133 MVP	Pentium-133	16	512	1.6	Diamond Stealth 30 2000	4/EDO DRAM	17/14.3	.28	8X
11	Vektron Home Office P133	Pentium-133	16	256	2.5	Matrox Mystique	2/SGRAM	15/14.1	.26	12X
12	AST Advantage 9304	Pentium-133	24	256	1.6	integrated S3 Trio64V+	1/EDO DRAM	15/13.8	.28	8X
13	CyberMax Cyrix Max C3 P166+	Cx6x86-P166+	24	512	2.1	ST8 Lightspeed 128	2/MDRAM	15/13.8	.28	12X
14	IBM PC 350 P-166	Pentium-166	16	256	1.3	integrated S3 Trio64V+	2/EDO DRAM	15/13.7	.28	6X
15	Compaq Presario 4402	Pentium-133	16	–	1.6	integrated S3 Trio64V+	1/EDO DRAM	15/13.6	.28	6X
16	Quantex QP6/200 Pro-4	Pentium Pro-200	32	256	2.5	ST8 Lightspeed 128	2/MDRAM	17/16	.26	12X
17	Diamond Mid Tower P166	Cx6x86-P166+	16	512	2.1	Diamond Stealth 30 2000	4/EDO DRAM	15/13.6	.28	8X
18	First Computer FCS P-133	Pentium-133	16	512	1.6	Matrox Millennium	2/WRAM	15/13.8	.28	8X
19	ProGen Discover MPEG II P150	Pentium-150	16	512	1.6	ProGen Gold 64V+ PCI	2/EDO DRAM	15/13.7	.28	8X
20	Compaq Deskpro 2000 Model 5200	Pentium-200	32	256	1.1	integrated Cirrus Logic 5436	2/EDO DRAM	15/14	.28	8X

* Best Buy [1] Five years on CPU and main RAM, three years on other parts. [2] Toll call. [3] Free tech support available first year only.

upgrading memory is a snap. It also comes with plenty of available expansion slots, drive bays, and SIMM sockets. The included Diamond Stealth 3D 2000 video card brims with a hefty 4MB of EDO DRAM, enough to give you high-resolution images in true color. The audio is good if not inspiring, with an integrated Vibra 16 sound chip and fair-quality Advent 270 speakers. The system's 2.1GB hard disk should provide enough room for most users. (Micron offers the same configuration in a Pentium-166 model that costs $200 more and runs about 5 percent faster; that unit is also a good value.)

Strong support is one of Micron's fortes. Aside from 24-hour-a-day technical support, you get a three-year parts and one-year labor warranty and a year of free on-site service. The one exception of late has been the long hold times on the toll-free tech support line. Our readers have been satisfied with the reliability of Micron PCs, and the Millennia's documentation is clear and concise. Micron hasn't yet joined the growing number of vendors that provide snazzy interactive on-screen help, but the printed manuals are easy to read and contain plenty of diagrams.

3 GATEWAY 2000 P5-133

PRO: Fast, great documentation, good design, $100 price drop

CON: No modem or sound card included in price

The Gateway 2000 P5-133 is a dynamite Best Buy for businesses, but it needs sound and a modem to make it a good home PC. Like the overwhelming majority of Gateway systems we test, the P5-133 is fast and well designed. Priced at just $1599, it's also eminently affordable. A big plus for business buyers: The low price includes the Microsoft Office Professional suite of business applications. This system is good-looking too, with a clean, angular case style that lends an up-to-date feel to an office. The P5-133 more than lives up to Gateway's reputation for cranking out speedy machines: It turned in an impressive PC WorldBench score of 192, making it one of the fastest Pentium-133s to appear on the Budget chart.

Gateway 2000 P5-133

		EXPANDABILITY						CUSTOMER SUPPORT			
Modem speed (kbps)	Sound board	Case style	Max. RAM (MB)	Maximum secondary cache (K)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
33.6	Creative Labs Vibra 16	minitower	64	512	1	3/1	5	3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	integrated Vibra 16	minitower	128	512	2	3/1	6	3 [1]/1	24	Sat., Sun.	CIS, WWW
–	–	minitower	128	256	1	2/2	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	Creative Labs Vibra 16	compact	128	256	2	0/0	2	3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	Ensoniq Soundscape Vivo PnP	tower	128	256	2	3/6	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	Sound Blaster 32 PnP	desktop	192	256	4	1/1	3	3/3	11 [2]	–	AOL, BBS, CIS, WWW
–	–	desktop	128	512	4	2/0	4	3/3	11 [2]	–	AOL, BBS, CIS, WWW
33.6	ESS ES1B6B PnP	tower	128	512	3	3/3	4	3/1	13.5 [3]	Sat.	WWW
33.6	Ensoniq Vivo 90	minitower	128	512	2	3/2	4	3/1	24	Sat., Sun.	BBS, Prodigy, WWW
33.6	Sound Blaster AWE32	minitower	256	512	2	3/0	3	3/3	11	Sat.	BBS, WWW
33.6	Sound Blaster 16	minitower	128	256	2	3/0	3	1/1	11	Sat.	BBS, CIS, WWW
33.6	integrated Crystal 4232	minitower	192	256	0	2/2	6	1/1	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
33.6	Ensoniq Soundscape Vivo 90	minitower	128	512	0	3/2	4	3/1	12	Sat.	BBS, WWW
–	–	desktop	192	512	4	1/1	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	integrated ESS 1BBB	desktop	128	256	2	0/0	2	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	Ensoniq Vivo 90	minitower	128	256	0	2/1	3	3/1	24	Sat., Sun.	BBS, Prodigy, WWW
33.6	3D Wavetable Sound	minitower	128	512	3	3/1	4	1/1	9	–	BBS, WWW
–	Audio Drive AD32 PnP	tower	128	512	2	3/0	6	1/lifetime	11	Sat.	WWW
33.6	Audio Drive 32 PnP	minitower	128	512	2	3/2	4	3/1	9	–	BBS
–	–	compact	128	256	2	2/0	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW

The unit we tested was competently configured, with a nice-size 2GB hard drive and an 8X Toshiba CD-ROM drive. The 2MB STB Lightspeed 128 video card is very good. It has ranked on our Top 10 Graphics Boards chart for several months because of its proficiency with business and graphics applications and its ability to handle a number of video clips at once. The 15-inch CrystalScan monitor is a reasonable match for the graphics card and a fine basic display, but it's not equal to Gateway's best (the more expensive Vivitron, which uses Trinitron technology).

Gateway's support policies are as good as those of any company on the chart, and readers tell us that the quality of service is top-notch. However, they still rate Gateway's PC reliability only as fair.

4 DELL OPTIPLEX GS+ 5200L

PRO: Small profile, fast, built-in networking

CON: No speakers, limited expandability

The slim little GS+ 5200L is the entry-level model in Dell's network-ready corporate desktop line. It's the perfect choice for the business buyer who needs an affordable power workstation. Thanks to a $172 price drop to $2282, its value is enhanced this month. Compared to Dimension PCs, its convenient space-saving design and built-in connectivity make it worth the extra dollars in a business setting.

Inside you'll notice Dell's usual attention to detail. The system is clean and easy to upgrade. On top of the processor is the largest heat sink we've seen, but in this case bigger is better. A heat sink is quieter than a fan, and this one doesn't get in the way of add-in cards the way heat sinks often do. The downside to the low-profile design is that there are only two slots available and no open drive bays.

Dell OptiPlex GS+ 5200L

Video signals are generated by an integrated S3 Trio64V+ graphics chip with 2MB of speedy VRAM and are pumped to a 15-inch Dell monitor that displays as nice a picture as you'll find in that size. Our test PC arrived with a Creative Labs Vibra 16 sound card but no speakers (Dell sells a basic set for $49).

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5 GATEWAY 2000 G6-180

PRO: One of the three fastest budget PCs, fast graphics card, $140 price drop

CON: Reliability rating is only fair

The G6-180 has earned a higher place on our Budget chart than any other Pentium Pro-180 system we've tested. And why not? It performs like something you'd find on our Power chart, with a PC WorldBench score of 218. At the same time, this huge, highly expandable tower is now priced within easy reach of mainstream budget buyers, thanks to a $140 price drop to $2039. Although our review unit was a Windows 95 PC, the G6-180's Pentium Pro processor and an upgrade to 32MB of RAM would make it a competent Windows NT workstation. Keep in mind that because of its size, this is not the kind of computer you can tuck out of the way at home or in your office. But it does provide room for nine extra drives and another five add-in cards. A large fan cools the motherboard.

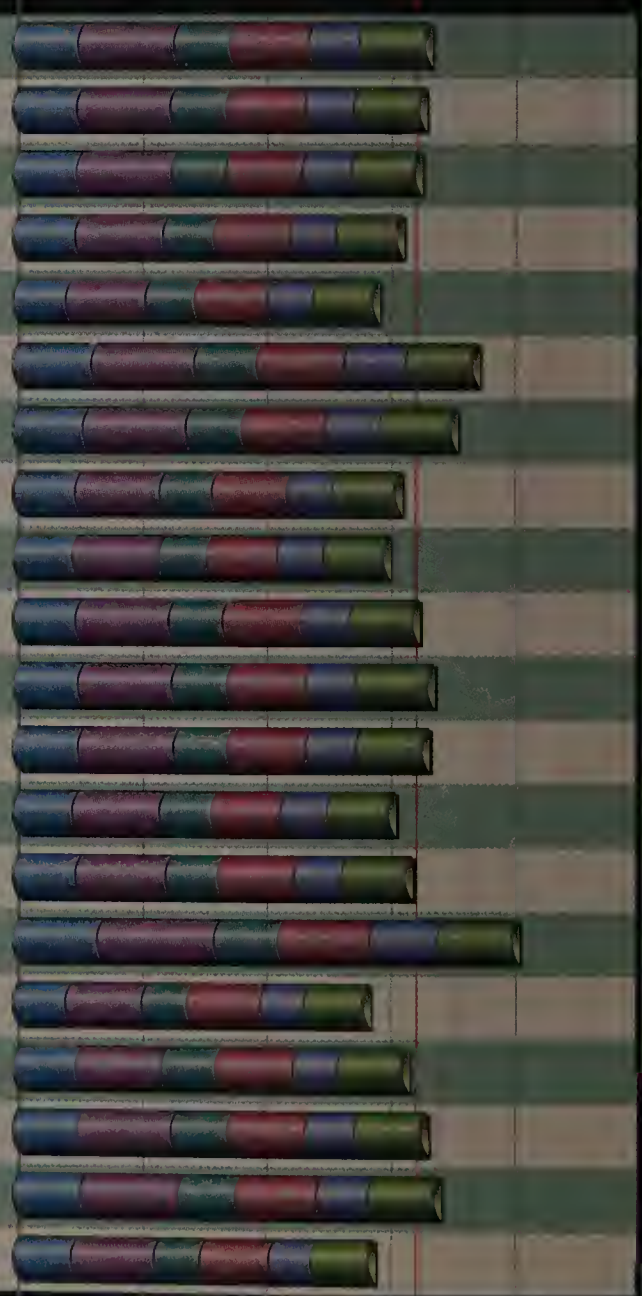
Gateway G6-180

The configuration includes a big 3.2GB hard drive and full multimedia. We weren't thrilled with the 15-inch Gateway Vivitron 15 monitor, however. It isn't the best Trinitron display we've seen; ▶

TOP 20 BUDGET DESKTOPS

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score
1	Dell Dimension P133v*	Pentium-133	16	256	188
2	Micron Millennia LXA P133*	Pentium-133	16	512	191
3	Gateway 2000 P5-133*	Pentium-133	16	256	192
4	Dell OptiPlex GS+ 5200L*	Pentium-200	16	256	201
5	Gateway 2000 G6-180*	Pentium Pro-180	16	256	218
6	HP Vectra VE 5/133	Pentium-133	16	256	166
7	HP Vectra XM 5/120 Series 4	Pentium-120	16	512	177
8	Kingdom 6x86 P166+ Value	Cx6xB6-P166+	32	512	202
9	Quantex QP5/166 SM-2	Pentium-166	32	512	209
10	DirectWave Blue Thunder P133 MVP Pro	Pentium-133	16	512	194
11	Vektron Home Office P133	Pentium-133	16	256	188
12	AST Advantage 9304	Pentium-133	24	256	189
13	CyberMax Cyrix Max C3 P166+	Cx6x86-P166+	24	512	205
14	IBM PC 350 P-166	Pentium-166	16	256	197
15	Compaq Presario 4402	Pentium-133	16	–	153
16	Quantex QP6/200 Pro-4	Pentium Pro-200	32	256	224
17	Diamond Mid Tower P166	Cx6x86-P166+	16	512	199
18	First Computer FCS P-133	Pentium-133	16	512	189
19	ProGen Discover MPEG II P150	Pentium-150	16	512	183
20	Compaq Deskpro 2000 Model 5200/1080	Pentium-200	32	256	218

*Best Buy



Word 7.0 for Windows 95 · Picture Publisher 6.0 for Windows 95 · WordPerfect 6.1 for Windows
Excel 7.0 for Windows 95 · Paradox 5.0 for Windows · 1-2-3 release 5 for Windows

HOW WE TEST All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details, visit PC World Online (http://www.pcworld.com/t20pcsnaps).

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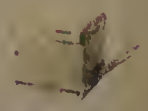
Phaser 550

Circle 124 on reader service card

its images could be sharper. We really like Gateway's documentation: It includes a glossy magazine with color pictures and screen shots to help you configure your PC. To sweeten the pot, Gateway throws in Microsoft Office Professional. Our readers give a high grade to Gateway's support but rate PC reliability only as fair.

New This Month

The following PCs made our Budget Desktops chart for the first time this month. For previously tested PCs on the chart, visit our Web page at http://www.pcworld.com/t20pcs.

8 KINGDOM 6X86 P166+ VALUE

PRO: Inexpensive, fast, good software bundle
CON: Less than stellar service policies

Cheap, cheap, cheap. Kingdom's bargain tower is priced at a mere $1597—that's with full multimedia, a fast 12X CD-ROM drive, and a modem. And it outperforms every Top 20 PC priced under $2000 except for the 13th-ranked $1649 CyberMax Cyrix Max C3 P166+, which also uses a Cyrix Cx6x86-P166+ CPU. The Cyrix processor is inexpensive, yet it allows both of these PCs to match or exceed the computing speed of an average Intel Pentium-166 system. In fact, the Kingdom 6x86 P166+ Value's PC WorldBench score of 202 is very good for a budget machine. The only drawback is that the Cyrix CPU runs somewhat hotter than its Intel rival. To compensate, Kingdom includes a second cooling fan.

Kingdom 6x86 P166+

Before you shell out your loot for this nicely put together little system, though, take note of Kingdom's meager service and support policies. The bargain price buys you a warranty of three years on parts and one year on labor—but there's no turnaround policy on service center repairs, and Kingdom won't sell you an on-site service contract.

If you can live within the service limitations, this system is a good value. It comes with a remarkable software bundle for such an inexpensive PC: SmartSuite, Grolier Encyclopedia, Time Multimedia Almanac, Body Works, and Win 95 Starts Here. If you plan to spend much time online, you'll like the 33.6-kbps modem. It will do a good job whether you're surfing the Web or downloading data.

The Kingdom is quite expandable, with plenty of available memory sockets, expansion slots, and drive bays. And tinkerers will be pleased by the tidy interior: Most of the cables are neatly tied off, although the power cable crowds the available PCI slots. While the components list is quite complete, the parts are mostly no-name, and the 15-inch Princeton Ultra 50 monitor is of middling quality.

The generic documentation leaves a lot to be desired. The manual explains PC and Windows basics, but the system it pictures doesn't remotely resemble the one we were testing. But what hurts the Kingdom most in our ratings are the aforementioned imperfect support policies. Toll-free tech support is available 13.5 hours per weekday with Saturday hours—but only for one year. If you want technical support for a longer period, you'll have to pay extra. In addition, the lack of on-site service is a significant omission for a system that's sold direct: If you have trouble with your PC, you may have no choice but to send it in for repairs. And with no established turnaround policy, there's no assurance of a timely return of your system. If you know PCs inside and out, this package is an attractive bargain. Otherwise, you should look elsewhere.

17 DIAMOND MID TOWER P166

PRO: Great price for a multimedia PC with modem
CON: Low-quality monitor, bare-bones manuals

The Diamond Mid Tower P166 is assembled from mostly generic components, but it comes with all the basics, and its amazingly low $1425 price should appeal to penny-pinchers. Built around Cyrix's low-cost but fast Cx6x86-P166+ CPU, the Diamond managed a PC WorldBench score of 199—just slightly below average for a Pentium-166–class system. Surprisingly, Diamond was able to include features like sound, speakers, and a 33.6-kbps modem. The 16-bit sound card even does wavetable sampling. But don't look for well-known brand names on the components. And a $10 set of headphones would be a major step up from the cheap speakers. We didn't expect a software bundle at this price, so we weren't disappointed to find just Windows 95 and some simple utilities.

Diamond did stock this system with a few good-quality storage components, including the same 2.1GB Western Digital hard drive that gets installed in high-end PCs, and an 8X Samsung CD-ROM drive that will satisfy all but the most demanding users. In addition, the Diamond Stealth 3D 2000 graphics board with 4MB of EDO RAM handles high color settings and 3-D applications. However, the 15-inch Impression 5 Plus monitor isn't much of a match for the graphics card. At least it doesn't add much to the cost of the system.

Diamond Mid Tower

There was some cable clutter inside the Diamond's case. But it's still easy to get to the four available expansion slots and three unpopulated RAM sockets.

Don't expect much in the way of handholding. You'll get just 9 hours of tech support per weekday. And while few Diamond customers have responded to our service and reliability surveys over the years, our own anonymous tech support calls have met with inconsistent responses varying from helpful to inept. Not surprisingly, the bargain price buys you just a one-year warranty on parts and labor.

This is far from a top-quality package. But if money is tight and you need a full system, you can't beat the price. ▶

Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Budget Desktops chart. For write-ups, see PC World Online (http://www.pcworld.com/t20pcsnaps).

- **CompuLink Infinity P-166 MMX**
- **Kingdom Pentium-200 Value**
- **Microniche Systems MGMi**
- **Monorail 7245**
- **National Microcomputers Expert P-200**
- **Smartworks P-166**

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PC WORLD

TOP 20 NOTEBOOK PCs

	POWER NOTEBOOKS	Last month	Month tested	Street price (1/9/97)	CPU	Comments
1	Gateway 2000 Solo 2100 S5-150 800/846-2000 www.gw2K.com	–	NEW	$4199	Pentium MMX-150	First Pentium MMX-150 is fastest yet—beats Solo P-133 from last month.
2	Micron TransPort MRX 888/634-8799 www.mei.micron.com	–	NEW	$3807	Pentium-133	$392 less than Solo S5-150. Smaller screen but better warranty, CD-ROM drive.
3	Dell Latitude LM P133ST 800/388-8542 www.dell.com	2	Oct 96	$2999	Pentium-133	Down a notch. Fast, good price, big active-matrix screen, multimedia.
4	Dell Latitude XPi P133ST 800/388-8542 www.dell.com	3	Aug 96	$3699	Pentium-133	Expensive for a unit without a CD-ROM drive, but still a very good value.
5	Compaq LTE 5250 800/345-1518 www.compaq.com	4	Dec 96	$3759	Pentium-120	Quick for a P-120, exceptionally well built; 10.4-inch screen is small.
6	AcerNote Nuovo 800/733-2237 www.acer.com	–	NEW	$3599	Pentium-133	Stupendous battery; slightly dim screen, one year of toll-free tech support.
7	Compaq LTE 5400 800/345-1518 www.compaq.com	–	NEW	$5799	Pentium-150	Well built with sharp screen, but expensive, and wrist rest is unusually slim.
8	Toshiba Portégé 650CT 800/999-4273 www.computers.toshiba.com	5	Mar 97	$3999	Pentium-133	The standard-bearer for subnotebooks; beautiful screen but no CD-ROM drive.
9	HP Omnibook 800CT 800/322-4772 www.hp.com/go/omnibook	6	Mar 97	$4370	Pentium-133	A nice subnotebook, but adding peripherals is a challenge.
10	Sharp W100T 800/237-4277 www.sharp-usa.com	7	Feb 97	$3499	Pentium-133	Fast, lightweight, with wide screen for viewing documents side by side.
	BUDGET NOTEBOOKS					
1	Compaq Armada 1120 800/345-1518 www.compaq.com	–	NEW	$1549	Pentium-100	Great price on rugged modular notebook with detachable handle.
2	Compaq Armada 1130T 800/345-1518 www.compaq.com	–	NEW	$2299	Pentium-120	Faster than Armada 1120; has more RAM, storage; active-matrix screen.
3	HP Omnibook 5500CS 800/322-4772 www.hp.com/go/omnibook	5	Jan 97	$2050	Pentium-100	$515 price drop on sturdy, well-designed note; CD-ROM drive $375 extra.
4	Digital HiNote VP 800/344-4825 www.windows.digital.com	1	Sept 96	$1699	Pentium-100	Light, well designed, great speed, bright screen. $100 price drop.
5	Compaq Presario 1010 800/345-1518 www.compaq.com	4	Feb 97	$2299	Pentium-120	$200 price cut on cool multimedia notebook.
6	Gateway 2000 Solo 2100 S5-120 800/846-2000 www.gw2K.com	2	Jan 97	$2499	Pentium-120	Fastest on Budget chart, but battery life is shortest.
7	Toshiba Satellite Pro 420CDS 800/999-4273 www.computers.toshiba.com	3	Sept 96	$2298	Pentium-100	Great price for multimedia notebook; internal AC adapter is a plus.
8	Toshiba Satellite 110CT 800/999-4273 www.computers.toshiba.com	6	Nov 96	$2099	Pentium-100	A good first notebook if you want an active-matrix screen; needs more RAM.
9	Mega Image MegaBook 911 800/250-1876 www.megai.com	8	Mar 97	$2699	Pentium-133	Very fast multimedia unit for the money, but support policies are weak.
10	AST Ascentia J20 800/876-4278 www.ast.com	9	Feb 97	$1799	Pentium-100	Fast little notebook with small hard drive, long warranty, but not many extras.

Best Buy See features chart, page 204; performance chart, page 206.

[1] To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews ($9.95, available March 26).

THE FIRST PENTIUM MMX-150 notebook we've tested, the $4199 Gateway 2000 Solo 2100 S5-150 shot straight to number one on the Power Notebooks chart this month, mostly on the strength of its performance. Liveliest travel companion: Acer's new AcerNote Nuovo, which ran for over 11 hours on one battery charge. Systems that missed the chart this month include IBM's new P-133, the ThinkPad 760ED. It offers speed, a beautiful screen, and a superb keyboard, but at $5999 it's too costly. For more details on the systems that didn't make the chart, see PC World Online (http://www.pcworld.com/t20pcsnaps).

SCORECARD

★ Overall rating	PC WorldBench score/ rating	Price	Vendor's system reliability	Features and design	Vendor's support quality/policies	Battery life (hours:min)/ rating	Traveling weight	Fax reprint number[1]	Reader service number
90	199/outstanding	average	average	outstanding	average/fair	3:12/good	heavy	3815	638
87	187/outstanding	average	average[2]	outstanding	[3]/fair	5:46/very good	heavy	3816	639
86	180/very good	inexpensive	average	very good	average/good	4:32/good	heavy	3779	640
86	166/very good	average	average	very good	average/good	5:20/very good	average	3771	641
86	149/good	average	above average	good	best/good	5:42/very good	average	3793	642
85	166/very good	average	below average[2]	good	[3]/fair	11:40/outstanding	heavy	3817	643
85	169/very good	very expensive	above average	very good	best/good	4:36/good	average	3818	644
85	156/very good	average	above average	very good	below average/good	2:33/satisfactory	light	3810	645
84	168/very good	average	below average[2]	good	[3]/fair	4:07/good	light	3811	646
84	165/very good	average	average[2]	very good	[3]/fair	2:26/satisfactory	light	3802	647
Power scorecard weightings ▶	Performance 22 percent	Price 14 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent		
84	84/satisfactory	very inexpensive	above average	satisfactory	best/fair	3:43/good	average	3819	648
83	140/very good	average	above average	good	best/fair	3:57/good	average	3820	649
83	152/outstanding	average	below average[2]	good	[3]/fair	4:00/good	average	3807	650
83	139/very good	inexpensive	[3]	good	[3]/fair	3:36/good	light	3776	651
82	143/very good	average	above average	good	best/fair	4:00/good	heavy	3803	652
82	171/outstanding	expensive	average	good	average/fair	2:15/satisfactory	average	3805	653
81	142/very good	average	above average	good	below average/good	4:02/good	heavy	3771	654
79	98/good	average	above average	good	below average/fair	3:35/good	average	3792	655
77	165/outstanding	expensive	[3]	very good	[3]/poor	4:38/good	heavy	3813	656
77	137/very good	inexpensive	below average	satisfactory	below average/good	3:25/good	light	3806	657
Budget scorecard weightings ▶	Performance 14 percent	Price 22 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent	All products:	903

[2] Limited data; score is based on responses for this company and average of all companies.
[3] Insufficient data.

POWER NOTEBOOKS

This Month's Best Buys

1 GATEWAY 2000 SOLO 2100 S5-150

PRO: Computing speed comparable to a Pentium-166 desktop system's, great screen, small footprint, terrific software bundle

CON: Poorly adjusted touchpad

Here it is: the notebook that has everything. With its ultrapotent Intel Pentium MMX-150 CPU, colossal 40MB of RAM, bright and sharp 12.1-inch 800 by 600 color screen, full multimedia, and quick 28.8-kbps fax-modem, the Gateway 2000 Solo 2100 S5-150 has what it takes to make an ideal road companion—and a number one Best Buy. In fact, it displaces last month's top notebook, the Gateway 2000 Solo 2100 S5-133. That version is still being sold, but the S5-150 has everything it has plus an extra megabyte of video RAM (for a total of 2MB), wavetable sound, and the MMX processor. At $4199, the S5-150 costs just $250 more, and it's noticeably faster. This is the first Pentium MMX-150 we've ▶

TOP 20 NOTEBOOK PCs — STANDARD FEATURES

	POWER NOTEBOOKS	CPU	Traveling weight (pounds)[1]	RAM (MB)	Hard drive (MB)	Color screen type	Screen diagonal (inches)	Screen resolution	Maximum screen colors	Battery type	Pointing device
1	Gateway 2000 Solo 2100 S5-150*	Pentium MMX-150	8.8	40	1440	active	12.1	800 x 600	65,536	lithium ion	touchpad
2	Micron TransPort MRX*	Pentium-133	9.2	32	1400	active	11.3	800 x 600	65,536	lithium ion	eraserhead, touchpad
3	Dell Latitude LM P133ST	Pentium-133	8.8	16	810	active	12.1	800 x 600	256	lithium ion	touchpad
4	Dell Latitude XPi P133ST	Pentium-133	7.2	24	1215	active	11.3	800 x 600	256	lithium ion	trackball
5	Compaq LTE 5250	Pentium-120	8.4	16	810	active	10.4	800 x 600	65,536	NiMH	eraserhead
6	AcerNote Nuovo	Pentium-133	10	16	1200	active	11.8	800 x 600	65,536	lithium ion	touchpad
7	Compaq LTE 5400	Pentium-150	8.4	32	2160	active	12.1	800 x 600	65,536	NiMH	eraserhead
8	Toshiba Portégé 650CT	Pentium-133	6.6	16	1358	active	11.3	800 x 600	16.8 million	lithium ion	eraserhead
9	HP Omnibook 800CT	Pentium-133	6.6	16	1440	active	10.4	800 x 600	256	lithium ion	mouse
10	Sharp W100T	Pentium-133	6.6	16	1080	active	11.2	1024 x 768	16.8 million	lithium ion	touchpad
	BUDGET NOTEBOOKS										
1	Compaq Armada 1120*	Pentium-100	7.5	8	778	dual-scan	10.4	640 x 480	256	NiMH	trackball
2	Compaq Armada 1130T*	Pentium-120	7.5	16	1080	active	10.4	800 x 600	256	NiMH	trackball
3	HP Omnibook 5500CS	Pentium-100	8	16	1358	dual-scan	11.3	800 x 600	65,536	lithium ion	eraserhead
4	Digital HiNote VP	Pentium-100	6.8	16	810	dual-scan	11.3	800 x 600	256	NiMH	touchpad
5	Compaq Presario 1010	Pentium-120	8.6	16	814	dual-scan	11.3	800 x 600	65,536	NiMH	touchpad
6	Gateway 2000 Solo 2100 S5-120	Pentium-120	8.2	16	810	dual-scan	11.3	800 x 600	65,536	lithium ion	touchpad
7	Toshiba Satellite Pro 420CDS	Pentium-100	8.8	16	772	dual-scan	11.3	800 x 600	65,536	lithium ion	eraserhead
8	Toshiba Satellite 110CT	Pentium-100	7.4	8	814	active	11.3	800 x 600	65,536	NiMH	eraserhead
9	Mega Image MegaBook 911	Pentium-133	9.2	16	1374	active	12.1	800 x 600	65,536	NiMH	touchpad
10	AST Ascentia J20	Pentium-100	7	16	540	dual-scan	11.3	800 x 600	65,536	NiMH	eraserhead

*Best Buy ● Yes ○ No [1] Includes computer, adapter, power cord, floppy drive, and CD-ROM drive if notebook has one. [2] Toll-free first year only.

reviewed, and it has speed to spare, with a record-breaking PC WorldBench score of 199 that compares favorably with that of an average Pentium-166 desktop.

Another drawing card for this notebook is Gateway's bundle of useful software: Microsoft's Office Pro, Bookshelf, and Money, plus Traveling Software's LapLink Windows 95 remote access program.

The S5-150 features a small footprint and an 8.8-pound traveling weight. Despite the bright active-matrix display, the Solo managed a good 3.2 hours in our battery life test. The multimedia components, a 6X CD-ROM drive and stereo sound and speakers, work well, as does the PC Card modem.

Gateway Solo S5-150

Despite this notebook's trim dimensions, the keyboard has good-size keys and a satisfying action with full travel. However, we were disappointed by the touchpad, which required adjustment to overcome an annoying oversensitivity.

Gateway's documentation is great, with glossy full-color pictures, easy-to-follow diagrams, and concise text. The one-year parts and labor warranty is nothing special, but you do get 24-hour round-the-clock technical support. *PC World* readers give Gateway notebooks an average grade for reliability, and readers still assess service as average. If you want a terrific notebook with a longer warranty, a much better battery life, and a price about $400 lower, check out our other Best Buy, the Micron TransPort MRX. It doesn't match the Solo's performance, and it has a smaller screen, but it's still a superb value.

2 MICRON TRANSPORT MRX

PRO: Fast, long battery life, fine software bundle

CON: None significant

If you want a portable with gobs of RAM, fast desktop-level performance, very good battery life, and all the power notebook bells and whistles,

		EXPANDABILITY					CUSTOMER SUPPORT			
CD-ROM drive speed	Modem speed (kbps)	Maximum RAM (MB)	Modular expansion bays	Bay for second battery	Optional docking station	Infrared port	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
6X	28.8	40	1	●	●	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
8X	33.6	48	2	●	○	●	3/1	24	Sat., Sun.	CIS, WWW
6X	–	40	1	○	●	●	3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
–	–	40	0	○	●	●	3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
6X	–	72	1	●	●	●	3/3	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
6X	28.8	64	0	○	●	●	3/3	24 [2]	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	–	72	1	●	●	●	3/3	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
–	28.8	80	0	○	●	●	3/3	24	Sat., Sun.	BBS, CIS, MSN, WWW
6X	–	48	0	○	●	●	3/3	12	–	AOL, BBS, CIS, WWW
–	28.8	32	0	○	○	●	3/3	24	Sat., Sun.	BBS, CIS, WWW
–	–	32	0	○	○	○	1/1	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
–	–	48	0	○	○	○	1/1	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
–	–	64	1	●	●	●	3/3	12	–	AOL, BBS, CIS, WWW
–	–	40	1	●	●	○	1/1	14	–	AOL, BBS, CIS, WWW
4X	–	40	0	○	○	○	1/1	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
6X	–	40	1	●	●	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
6X	–	40	1	○	●	●	3/3	24	Sat., Sun.	BBS, CIS, MSN, WWW
–	–	40	0	○	●	○	1/1	24	Sat., Sun.	BBS, CIS, MSN, WWW
6X	–	72	0	○	●	●	1/1	24	Sat.	WWW
–	–	40	0	○	○	●	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW

the Micron TransPort MRX is a terrific choice. It will appeal especially to the more price-sensitive buyer who needs a long battery life. At $3807, the TransPort costs $392 less than the number one Gateway 2000 Solo 2100 S5-150, and its battery lasted over 70 percent longer in our test—a full 5.8 hours.

Although it's not as quick as the Gateway, it's still very fast: about 10 percent quicker than the average PC on our Power Notebooks chart and only about 7 percent slower than the average desktop we've reviewed. And the hefty 32MB of RAM will keep you from having to dip into speed-robbing virtual memory when you're opening a lot of big files. You don't even have to spring for basic business software: Micron throws in Microsoft Office Pro and Bookshelf.

The clear, bright 11.3-inch color active-matrix screen is a fair compromise between size and economy. In addition, the 8X CD-ROM drive is among the fastest we've seen on a portable to date. The stereo sound is good too, with the speakers set toward the outside edges of the wrist rest so your palms don't block the sound as you type. Meanwhile, the 33.6-kbps modem will handle all your data transmissions at a fast clip.

Micron TransPort MRX

The keyboard is well laid out, with good-size keys, a springy action, and full travel. You even get an eraserhead plus a touchpad, and both work well.

At 9.2 pounds with all its drives and adapters, the Micron TransPort MRX is typically heavy for a full-size notebook with complete multimedia features.

The manual is straightforward and illustrated in good detail. If you have serious trouble, the TransPort MRX comes with a three-year parts, one-year labor warranty. Technical support is available around the clock, and the limited reader response we've had on Micron portables indicates that reliability is average.

New This Month

The following PCs made our Power Notebooks chart for the first time this month. For previously tested PCs on the chart, visit our Web page at http://www.pcworld.com/t20pcs.

6 ACERNOTE NUOVO

PRO: Fast, Methuselah-like battery life

CON: Only one year of toll-free tech support

The stylish AcerNote Nuovo is hard to resist, with its good speed, big screen, long warranty, and amazing battery life. But limited toll-free tech support and questionable system reliability keep us from giving it an unqualified endorsement.

AcerNote Nuovo

But oh, that battery! We couldn't get it to run down in a normal workday. Finally one of our testers put in a performance fit for *The Guinness Book of World Records*, using the keyboard for the 11 hours, 40 minutes it took to drain the power cells. Acer chalks up the superb results to sophisticated new power management.

The Nuovo is fast too, scoring 166 on PC WorldBench. And the price is a reasonable $3599. At 10 pounds traveling ▶

TOP 20 NOTEBOOK PCs

	POWER NOTEBOOKS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score
1	Gateway 2000 Solo 2100 S5-150*	Pentium MMX-150	40	256	199
2	Micron TransPort MRX*	Pentium-133	32	256	187
3	Dell Latitude LM P133ST	Pentium-133	16	256	180
4	Dell Latitude XPi P133ST	Pentium-133	24	256	166
5	Compaq LTE 5250	Pentium-120	16	256	149
6	AcerNote Nuovo	Pentium-133	16	256	166
7	Compaq LTE 5400	Pentium-150	32	512	169
8	Toshiba Portégé 650CT	Pentium-133	16	256	156
9	HP Omnibook 800CT	Pentium-133	16	256	168
10	Sharp W100T	Pentium-133	16	256	165
	BUDGET NOTEBOOKS				
1	Compaq Armada 1120*	Pentium-100	8	–	84
2	Compaq Armada 1130T*	Pentium-120	16	–	140
3	HP Omnibook 5500CS	Pentium-100	16	256	152
4	Digital HiNote VP	Pentium-100	16	–	139
5	Compaq Presario 1010	Pentium-120	16	–	143
6	Gateway 2000 Solo 2100 S5-120	Pentium-120	16	256	171
7	Toshiba Satellite Pro 420CDS	Pentium-100	16	–	142
8	Toshiba Satellite 110CT	Pentium-100	8	–	98
9	Mega Image MegaBook 911	Pentium-133	16	256	165
10	AST Ascentia J20	Pentium-100	16	–	137

*Best Buy

HOW WE TEST All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details, visit PC World Online (http://www.pcworld.com/t20pcsnaps).

Beauty.

Full.

Ever see something so beautiful that you fail to realize how intelligent it is? If not, you've probably never seen Dodge Avenger. And now it's going to be even tougher to get past Avenger's great looks, because for 1997 we made numerous styling enhancements, including new sculpted front and rear fascias, new colors, a new black and tan leather interior choice, new fog lamps and a new rear spoiler for Avenger ES, available cast-aluminum 17-inch wheels and even new 14-inch wheel covers for the base model. So to maintain that crucial esthetic/intellectual balance, we made this smart automobile even more intelligent. Consider: available new 6-speaker 3-in-1 stereo system with AM/FM, cassette and compact disc • elevated rear seating to give people in back a better view of the road up front • split/folding rear seats • enough interior space for five adults • 2.5L, V-6, SOHC, 24-valve engine (available on base and ES)

• available lock-out protection that prevents power door locks from being locked inadvertently when keys are left in the ignition • remote trunk and fuel door release • 4-wheel independent double-wishbone suspension and rigid body structure for handling and quiet ride • available 4-speed automatic transmission, with selectable overdrive for enhanced fuel economy when on and more power when off

Always wear your seat belt.

• driver and front passenger airbags • available anti-lock brakes • optional remote keyless entry with personal alarm • available HomeLink® Universal Transmitter lets you open the garage and, when properly equipped, turn on the house lights from a built-in remote in the visor • our Customer One Care™ 3-year or 36,000-mile bumper-to-bumper warranty and 3/36 Roadside Assistance. See limited warranty & restrictions at dealer. Excludes normal maintenance & wear items. For more information, call 1-800-4-A-DODGE or visit our Web site at http://www.4adodge.com

Avenger **The New Dodge**

weight, though, the Nuovo's heavy.

This sturdily built notebook has a nice array of multimedia and graphics components, including a 6X CD-ROM drive, good sound (though we heard stray pops and clicks on boot-up), and a likable 11.8-inch active-matrix screen. The display is big enough to easily handle its 800 by 600 text and graphics—but we wish we could get it a bit brighter.

We like the gentle tilt the notebook gives the keyboard as it opens. The keyboard and touchpad both worked well.

The system's documentation is good: The user guide is concise, well written, and nicely illustrated. However, support policies are a mixed bag. Acer has round-the-clock toll-free tech support, but only for one year; then you pay the toll. The three-year warranty is very good.

We don't have many fax-back responses from readers on Acer's service or the reliability of its notebooks. Those we have suggest that reliability is less than sterling and is declining.

7 COMPAQ LTE 5400

PRO: Fast, excellent display, high 72MB RAM limit

CON: Very expensive, small wrist rest

If you have to ask how much this notebook costs, you can't afford it: $5799 is a big wad of cash, and the unit has no CD-ROM drive or modem. What *do* you get? Fine speed, above-average reliability, super service, flawless construction, and a lovely screen. The exceptional display does a lot to ease the sticker shock: It's a generous 12.1 inches, supports up to 16-bit color at 800 by 600 resolution, and renders razor-sharp graphics and text.

This P-150 scored 169 on our PC WorldBench suite, a hair quicker than the average for its kind. It's stocked with 32MB of RAM, enough to keep performance high when handling multiple programs and gigantic files. The storage and the battery life also leave little to be desired: The 2.2GB hard drive is the biggest one on our chart, and the battery lasted about 4.5 hours in our test.

Compaq LTE 5400

The speakers are located on either side of the screen for optimal sound projection. The keyboard is roomy and responsive, with a lively action. And the eraserhead pointing device works well, although its tiny buttons take some getting used to.

The LTE 5400 is backed by Compaq's terrific service, plus a three-year warranty and round-the-clock toll-free technical support. Our readers give the company a best rating for service and above average for reliability.

Compaq Armada 1120

BUDGET NOTEBOOKS

This Month's Best Buys

1 COMPAQ ARMADA 1120

PRO: Very inexpensive, sturdy

CON: No multimedia features or modem

The Compaq Armada 1120 is far from a world-class performer. But it's a very low-cost, sturdy basic notebook with a good dual-scan screen, above-average reliability, and fine support. That's enough to earn it our top Best Buy. To get it at the $1549 price, you must order this 7.5-pound Pentium-100 à la carte, with just 8MB of RAM and a 778MB hard drive. As is, the speed is okay for a bargain notebook, although the unit's PC WorldBench score of 84 is the lowest here. The average for the other budget P-100s on the chart is over 50 percent higher. For more speed, spend an extra $115 for 8MB more RAM. As with the 1120's sibling the Armada 1130T, upgrades are as easy as sliding off a cover and snapping in the RAM.

Both Armadas are sturdily constructed, with a thick, rugged black shell and a strong removable handle. Compaq also includes Microsoft Works and Netscape Navigator (but no modem) with both.

These systems are well designed. The keyboards have a crisp, lively action, and the Armada line features a very good trackball. But there are no covers to protect the units' ports. Mobile users will welcome the good battery life of near 4 hours on both PCs. The 1120's sharp 10.4-inch dual-scan screen displays crisp text and graphics at 640 by 480 resolution.

The manuals, both printed and on-screen versions, are excellent. There's just a one-year warranty on these budget systems, but you still get Compaq's above-average notebook reliability. Readers responding to our ongoing fax-back survey rate the company's service as best.

2 COMPAQ ARMADA 1130T

PRO: Fast, extremely sturdy, crisp display

CON: No multimedia features or modem

If you like the Armada 1120 but wouldn't mind spending more to get a better screen, much faster performance, and more RAM and storage, the $2299 Armada 1130T should fit the bill. It's a terrific value in its own right, and it also earns a Best Buy this month.

The extra $750 buys you a faster, Pentium-120 CPU; 16MB of RAM; and a 1.1GB hard drive. The Armada 1130T's very good PC WorldBench score of 140 shows how much difference the CPU and RAM make. The unit's active-matrix screen is vivid, bright, and noticeably better than the 1120's dual-scan screen. The 1130T's 800 by 600 resolution is also higher, giving you clearer graphics and sharper text, and displaying a larger portion of a page at once. The one catch is that the 10.4-inch screen is no larger than the 640 by 480 display on the Armada 1120, so text and graphics look proportionately smaller. ■

Compaq Armada 1130T

Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Notebook PCs chart. For write-ups, see PC World Online (http://www.pcworld.com/t20pcsnaps).

- 5D Technology PMD-5700
- Canon InnovaBook 490CDT
- IBM ThinkPad 760ED
- Panasonic CF-61 FXF4AAM
- Sharp PC-9080
- Smartworks Slimnote 8

Win a Gateway 2000 P5-133

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Gateway 2000 P5-133, a Pentium-133 PC in this month's Top 20. Send in a separate copy of the survey for each of your PCs.

HOW TO ENTER: FOR BEST RESULTS, PHOTOCOPY THIS PAGE. Fax your completed survey to 415/357-4522. Do NOT fax a cover page. Or mail it to *PC World*, Box 4-SS, c/o 800-SCAN, 543 Howard St., San Francisco, CA 94105-3013. Surveys must be received by April 30.
PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact winners by telephone and fax. If *PC World* is unable to do so within 30 days of the drawing, a new winner will be selected. No purchase necessary. Void where prohibited by law.
HOW TO FILL OUT THE FORM: Print your name (block capital letters) and your fax number, and fill the circles for each digit of your daytime phone number. Then fill out the questionnaire. AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER — —

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

How did you get this copy of *PC World*?
○ By subscription ○ On the newsstand ○ From someone else

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

○ Acer	○ Digital (DEC)	○ IBM	○ Packard Bell	○ Tangent
○ Acma	○ DTK	○ Insight	○ Panasonic	○ Texas Instruments
○ ALR	○ EPS	○ Intelesys	○ PerComp	○ Toshiba
○ Apple	○ Epson	○ Leading Edge	○ Pionex	○ Twinhead
○ AST	○ Everex	○ Micro Express	○ Polywell	○ Unisys
○ Austin (IPC)	○ Fujitsu	○ Micron	○ Premio	○ USA Flex
○ Compaq	○ Future Tech	○ Midwest Micro	○ Quantex	○ Vektron
○ Compudyne	○ Gateway 2000	○ MIS	○ Robotech	○ WinBook
○ Comtrade	○ Hewlett-Packard	○ Nat'l Micro	○ Samsung	○ Xi
○ CTX	○ HiQ	○ NCR	○ Sharp	○ Zenith (ZDS)
○ Dell	○ Hitachi	○ NEC	○ Sony	○ Zenon
○ Diamond	○ Hyundai	○ Netis	○ Swan	○ Other

What size is this PC?
○ Desktop
○ Notebook/laptop
○ Handheld

What is the CPU?
○ PowerPC
○ Pentium
○ Pentium Pro
○ 80486
○ Other

Where did you buy this PC?
○ Local dealer
○ Mail/phone order
○ Direct from field sales force
○ Membership discount store
○ Computer superstore
○ Home electronics store
○ Retail store
○ Value-added reseller
○ Other

After ordering, how long did it take to get your PC?
○ Less than 1 week
○ 1-2 weeks
○ 3-4 weeks
○ More than 4 weeks

Who set up your PC?
○ Dealer/retailer/VAR
○ Staff computer technician
○ Self or coworker

Where do you use this PC? ○ At home/home office ○ At work ○ Both

WHEN YOU FIRST GOT YOUR PC

When did you buy this PC? (Specify month and year.)

○ Jan	○ Mar	○ May	○ July	○ Sept	○ Nov	○ 92	○ 94	○ 96
○ Feb	○ Apr	○ June	○ Aug	○ Oct	○ Dec	○ 93	○ 95	○ 97

When you first set up your PC, were any components "dead on arrival" (DOA)?
○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)

○ Battery	○ Graphics/video board	○ Modem/fax board	○ Power supply
○ CD-ROM	○ Hard drive	○ Monitor/screen	○ Sound board
○ CPU	○ Keyboard	○ Motherboard	○ Other
○ Floppy drive	○ Memory	○ Mouse	

Did your problem occur only after you added your own hardware or software?
○ Yes ○ No ○ Don't know

Would you buy this brand of PC again?
○ Yes ○ No ○ Not sure

How many times have you had a problem with this PC?
○ No problem ever ○ Three
○ One ○ Four
○ Two ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Answer for the most recent problem—*other than DOA*—not reported in a prior survey.

When did this problem occur? (Specify month and year.)

○ Jan	○ Mar	○ May	○ July	○ Sept	○ Nov	○ 92	○ 94	○ 96
○ Feb	○ Apr	○ June	○ Aug	○ Oct	○ Dec	○ 93	○ 95	○ 97

How long after you purchased your PC did the problem occur?
○ Less than 1 month ○ 4-6 months ○ More than 12 months
○ 1-3 months ○ 7-12 months ○ Not sure

Did the problem occur as a result of adding new hardware or software?
○ Yes ○ No ○ Don't know

Did the problem occur under warranty?
○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)
○ Faulty component ○ Wrong configuration ○ Device conflicts ○ Other
○ Incorrectly installed software ○ Faulty peripheral ○ OS problem ○ Don't know

If a component failed, which one was it? (Mark all that apply.)

○ Battery	○ Graphics/video board	○ Modem/fax board	○ Power supply
○ CD-ROM	○ Hard drive	○ Monitor/screen	○ Sound board
○ CPU	○ Keyboard	○ Motherboard	○ Other
○ Floppy drive	○ Memory	○ Mouse	

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your PC?
○ Manufacturer
○ Dealer/store where purchased
○ Manufacturer's authorized repair technician
○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)
○ Phone ○ System swap
○ On site ○ Component swap
○ In store ○ Factory return

If you received phone service, how long were you on hold?
○ Not at all ○ 1-2 minutes ○ 6-10 minutes ○ More than 20 minutes
○ Less than 1 minute ○ 3-5 minutes ○ 11-20 minutes

How long did it take before you talked to the person who finally helped you?
○ Less than 15 minutes ○ 2-5 hours ○ 11-24 hours ○ 3-5 days
○ 15 minutes-1 hour ○ 6-10 hours ○ 1½-2 days ○ 1 week or more

How long did it take to resolve the problem completely?
○ 1-2 days ○ More than 1 month
○ 3-7 days ○ Never resolved
○ 8-14 days ○ Awaiting resolution
○ 15-30 days

Was it resolved to your satisfaction?
○ Yes ○ No

How would you rate the person(s) who helped you?

	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of PC again?
○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?
○ Not at all ○ ○ Satisfied ○ ○ Extremely satisfied

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ISO 9002

CHIP TIP

PC WORLD TOP 10 Monitors

Circle 206 on reader service card

PC WORLD

TOP 10 PRINTERS

	MONOCHROME PERSONAL PRINTERS	Month tested	Street price (1/16/97)	Overall rating	Speed for plain text (ppm)	Speed for full-page graphics (ppm)	Comments	Reader service number
1	Panasonic KX-P6100 800/742-8086 http://www.panasonic.com	Apr 96	$399	84	5.7	2.3	**FEATURES:** 6-ppm laser. Standard 256K of RAM, 1200-by-300-dpi maximum resolution, 100 sheets input, 50 output. **PRO/CON:** Low price; quicker than most; space-saving tower design; excellent print quality for 300-dpi resolution. Tech support is automated in off-hours; no manual feed slot for envelopes.	726
2	Brother HL-720 800/827-6843 http://www.brother.com	Dec 96	$350	84	5.4	1.1	**FEATURES:** 6-ppm laser. Standard 512K of RAM, 600-by-600-dpi maximum resolution, 200 sheets input, 100 output. **PRO/CON:** Low price, good performance, straighter paper path helps prevent jams, includes Surf 'n' Print utility for printing Web pages. Takes up a lot of space when you unfold the output tray.	727
3	NEC SuperScript 860 800/632-4636 http://www.nec.com	Aug 96	$499	84	6.9	1.7	**FEATURES:** 8-ppm laser. Standard 1MB of RAM, 600-by-600-dpi maximum resolution, 200 sheets input, 50 output. **PRO/CON:** Fastest laser on chart; comes with slick software that makes it easy to print booklets, posters, and more. Most expensive of Top 10; gray-scale output is so-so.	728
4	Canon LBP-465 800/848-4123 http://www.ccsi.canon.com	NEW	$349	83	3.8	0.6	**FEATURES:** 4-ppm monochrome laser; standard 256K of RAM; 600-by-600-dpi maximum resolution; 100 sheets input. **PRO/CON:** One of least expensive lasers on chart; very good print quality, easy to set up and install, thorough manuals. Slowest monochrome printer here; no output tray.	729
5	HP LaserJet 5L Xtra 800/752-0900 http://www.hp.com	Dec 96	$399	82	3.9	0.7	**FEATURES:** 4-ppm laser. Standard 1MB of RAM, 600-by-600-dpi maximum resolution, 100 sheets input, 100 output. **PRO/CON:** Price dropped from $479 to $399. Great-looking text and graphics; easy to use; generous CD-ROM bundle; input tray lets you load envelopes without removing paper. Slow.	730
	COLOR PERSONAL PRINTERS							
1	Epson Stylus Color 500 800/463-7766 http://www.epson.com	Dec 96	$279	79	1.7	0.4	**FEATURES:** 4-ppm monochrome/1-ppm color ink jet. 720-by-720-dpi maximum resolution, 100 sheets input, 30 output. Accepts both black and color cartridges. **PRO/CON:** Impressive speed and print quality; low cost per page; two-year warranty; pretty good CD-ROM bundle. Lacks manual feed slot.	–
2	Canon BJC-620 800/848-4123 http://www.ccsi.canon.com	Feb 97	$399	78	0.9	0.4	**FEATURES:** 6-ppm monochrome/2-ppm color ink jet. 720-by-720-dpi maximum resolution, 100 sheets input. Separate cartridge for each color. **PRO/CON:** Laser-quality text on coated paper. Plain-paper quality is average; doesn't support photo or neon inks that other Canon ink jets use; no output tray.	731
3	Canon BJC-4200 800/848-4123 http://www.ccsi.canon.com	Dec 96	$279	78	1.1	0.2	**FEATURES:** 5-ppm monochrome/1-ppm color ink jet. 720-by-360-dpi maximum resolution, 100 sheets input. Accepts both black and color cartridges. **PRO/CON:** Software bundle lets you print everything from business brochures to storybooks. Overall print quality and speed lag behind the Epson's.	732
4	HP DeskJet 693C 800/752-0900 http://www.hp.com	Dec 96	$299	78	1.7	0.3	**FEATURES:** 3-ppm monochrome/0.8-ppm color ink jet. 600-by-600-dpi maximum resolution, 100 sheets input, 100 output. Accepts both black and color cartridges. 690C is same printer without software. **PRO/CON:** Price has dropped $50; optional kit provides best photo quality of any DeskJet.	733
5	HP DeskJet 820Cse 800/752-0900 http://www.hp.com	Dec 96	$399	77	3.8	0.3	**FEATURES:** 5-ppm monochrome/1.5-ppm color ink jet. 600-by-600-dpi maximum resolution, 150 sheets input, 50 output. Accepts both black and color cartridges. **PRO/CON:** Very good print quality, excellent paper handling, best monochrome print speed. Does merely fair job with photographic images.	734

Best Buy For expanded reviews, visit http://www.pcworld.com/t10printers. Windows 95-certified Plug and Play All products: 908

HOW WE TEST The overall rating for both monochrome and color workgroup printers is based on print quality (27 percent), price (20 percent), features and ease of use (20 percent), speed (15 percent), service and support (13 percent), and cost of consumables (5 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

THE BEST BARGAINS look like you paid more. Canon's LBP-465 laser costs just $349, but its print quality is better than that of our Best Buy. Debuting at number four on the monochrome chart, the Canon is an economical choice—but a slow one.

Some price reductions from HP also caused shifts. The LaserJet 5L Xtra's recent drop from $479 to $399 bumped it above the Panasonic KX-P6500 in the rankings; that, coupled with the ▶

Canon's debut, pushed the Panasonic off the monochrome chart entirely. We also tested the new NEC SuperScript 660plus monochrome laser, but it had too many design flaws to make the cut.

The price of the HP DeskJet 693C dropped from $349 to $299. It rises to number four among the color printers, moving the HP DeskJet 820Cse to number five. At press time we also learned that the NEC SuperScript 860's price would drop from $499 to $399, effective April 1; this makes our fastest monochrome printer an even better value.

None of the three new color printers we tested this month made the cut. Lexmark's $199 2030 Color Jetprinter and NEC's $169 SuperScript 100C are two of the least expensive ink jets we've tested. The $499 Alps MD-2010 Photo-Realistic Color Printer creates images as good as any monochrome or color laser's, but it prints too slowly for general use.

GOOD PRICE, GOOD PRINTING

A LOW $349 STREET PRICE makes the Canon LBP-465 our least expensive monochrome printer; superior text and line art also helped it make the Top 10. Its gray-scale images lack contrast, however—it would be a poor choice for complex presentation slides or scanned photos. But the LBP-465's biggest flaw is its slow, sub–4-ppm speed: The other monochrome printers here have 6- or 8-ppm engines and can print much faster.

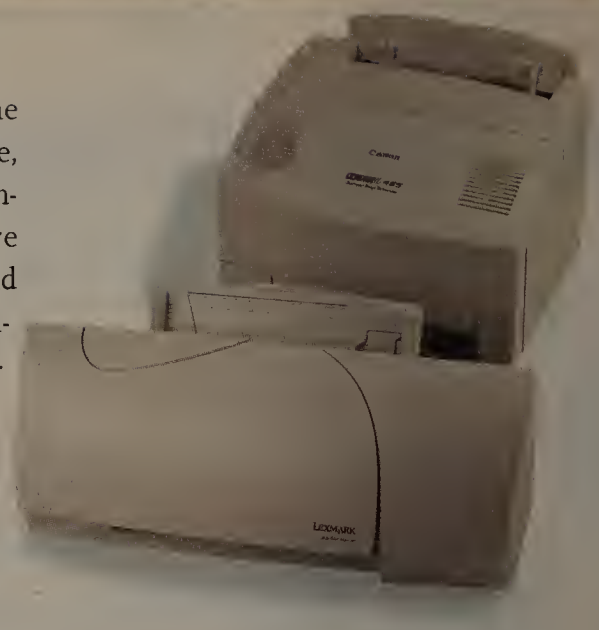
Except for speed, the Canon excels. The LBP-465 was very easy to install and use, even though it has no status lights or control buttons; an unobtrusive software interface gives you all the information and control you need. Canon's support policies are among the best; they include toll-free phone support 18 hours daily.

We do miss having an output tray—Canon doesn't sell one for the LBP-465. Our test unit pushed printed sheets off the desk until we improvised a stop.

The NEC SuperScript 660plus is reasonably fast, but its print quality and design were disappointing: Gray-scale output looked dark and gritty. The separate toner cartridge and imaging drum are awkward to install. Badly written documentation makes using the printer harder than it should be, and the software interface has obscure icons. The NEC also wrinkled the stationery envelopes we fed through it. So why is its relative, the $499 SuperScript 860, in third place? The latter machine's design is completely different, with far fewer flaws; the print quality is better; and it's a lot faster.

BEST SUB-$200 INK JET

SLOW PERFORMANCE and an excessively pared-down design kept Lexmark's 2030 Color Jetprinter ink jet off the color chart. But if your budget is tight, give it a second look: It's the only sub-$200 color printer that can take both black and color ink cartridges at the same time. The 2030 also takes a waterproof black ink that prints cleaner text and line art. This ink costs just a little more—$35.95 per cartridge compared with the regular ink's $32.95. Unfortunately, gray-scale images remain coarse, regardless of ink.



BUDGET-CONSCIOUS CHOICES: The Lexmark 2030 Color Jetprinter (front) costs just $199. And at $349, the Canon LBP-465 is one of our Top 10's lowest-priced lasers.

Other drawbacks to the Lexmark: It has no output tray. Its power supply is an ungainly external AC adapter. Other than the brief installation guide, all documentation is on screen—and it's just a random soup of useless factoids. Envelopes and transparencies must be hand-fed.

We can't make even a qualified recommendation for NEC's SuperScript 100C. Print quality is mediocre, the design is clunky, and it was one of the slowest color ink jets we've tested—a simple text page took more than two minutes to print.

BETTER THAN A COLOR LASER?

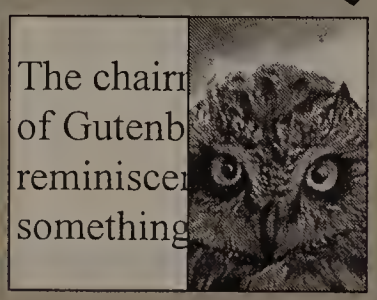
THE NEW Alps MD-2010 didn't make the color chart either, but it's worth considering for someone who wants to print intricate color images on a budget. The Alps' pages look just as good or better than a laser's; only line art is fuzzy-looking. The dry-ink cartridges cost $6.60 and last 580 pages for text printing—cheaper per page than ink jet cartridges. But the MD-2010 is slow; it took more than a minute to print a page of text and five minutes for a full page of graphics.

—*Dan Littman* ■

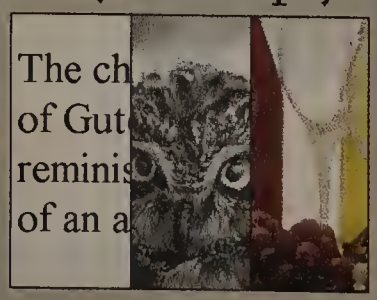
PRINT QUALITY SAMPLES

Alps MD-2010: Color Laser Quality, Cheaply

ALPS MD-2010
The Alps' dry ink makes impeccable text and color images, so it's a natural for presentation slides. But gray-scale prints are dark, and line art is a little fuzzy.



CANON LBP-465
The Canon's text and line art are very well drawn. Its gray-scale images lack contrast, however, so it's not recommended for presentations or complex images.



LEXMARK 2030 COLOR JETPRINTER
A special waterproof black ink (shown here) improves the Lexmark's text quality, but gray-scale images are coarse. Color is acceptable.

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PC WORLD

TOP 10 MONITORS

	15-INCH MONITORS	Month tested	Street price (1/21/97)	Overall rating	Quality of text/graphics	Comments	Reader service number
1	Dell UltraScan 800HS 800/289-3355 http://www.dell.com	Feb 97	$399	83	excellent/ excellent	FEATURES: 13.7-inch viewable screen, 0.25mm Trinitron tube, up to 110-Hz refresh rate [1], Level 2ab Plug and Play ready [2], 24-hour daily toll-free support. PRO/CON: Low price, terrific text and graphics detail, easy-to-use on-screen gauges; brief one-year warranty, very faint line across screen.	678
2	Hitachi SuperScan Pro 500 800/536-6721 http://www.nsa-hitachi.com	NEW	$369	80	very good/ very good	FEATURES: 13.6-inch viewable screen, 0.28mm dot pitch tube, up to 85-Hz refresh rate [1], Level 2b PnP ready [2], three-year warranty, 8-hour daily toll-free technical support. PRO/CON: Terrific low price, very crisp text detail, accurate color graphics quality; small screen size, tedious button pressing to navigate on-screen menus.	679
3	Samsung SyncMaster 15GLi 800/933-4110 http://www.sosimple.com	Oct 95	$379	80	very good/ good	FEATURES: 13.6-inch viewable screen, 0.28mm dot pitch tube, up to 100-Hz refresh rate [1], Level 2b PnP ready [2], color calibration software, three-year warranty, 24-hour daily toll-free support. PRO/CON: $29 price drop, very sharp text, bright graphics, extensive on-screen menus, easy to adjust; small viewable screen.	680
4	Panasonic PanaMedia PM 15 800/742-8086 http://www.panasonic.com	June 96	$399	79	very good/ good	FEATURES: 14-inch viewable screen, 0.27mm dot pitch tube, up to 107-Hz refresh rate [1], Level 2b PnP ready [2], speakers and mike, three-year warranty, 24-hour daily toll-free support. PRO/CON: Low price, big screen, very sharp text, ample on-screen controls, easy to adjust; screen is a little dim in the corners.	681
5	MAG InnoVision DX15T 800/827-3998 http://www.maginnovision.com	Aug 96	$369	79	very good/ very good	FEATURES: 13.9-inch viewable screen, 0.25mm Trinitron tube, up to 85-Hz refresh rate [1], Level 2b PnP ready [2], three-year warranty. PRO/CON: $10 price drop, easy-to-read text and spreadsheet cells, realistic color graphics quality; navigating on-screen menus requires repetitive button pushing, faint line across screen.	682
6	NEC MultiSync XV15+ 800/632-4636 http://www.nec.com	Jun 96	$399	79	good/ very good	FEATURES: 13.5-inch viewable screen, 0.28mm dot pitch tube, up to 103-Hz refresh rate [1], Level 2b PnP ready [2], color calibration software, three-year warranty. PRO/CON: $50 price drop, very sharp graphics detail, easy to adjust; slightly blurred text along left side of screen, no on-screen menus or gauges, small viewable screen.	683
7	Sony CPD-100VS 800/476-6972 http://www.sony.com/pc	Feb 97	$529	79	excellent/ excellent	FEATURES: 13.8-inch viewable screen, 0.25mm Trinitron tube, up to 85-Hz refresh rate [1], Level 2b PnP ready [2], built-in speakers, subwoofer, and microphone, 11-hour weekday toll-free support. PRO/CON: $50 price drop, great text and graphics detail, boombox sound quality, easy to adjust; one-year warranty, expensive.	684
8	ViewSonic 15GS 800/888-8583 http://www.viewsonic.com	Feb 97	$399	78	good/ very good	FEATURES: 13.8-inch viewable screen; 0.28mm dot pitch tube; up to 108-Hz refresh rate [1], Level 2b PnP ready [2], three-year parts, one-year labor warranty, 11-hour weekday toll-free support. PRO/CON: Low price, very crisp graphics, TCO-92 compliant; controls require repetitive button pressing, no image-tilt control.	685
9	Mitsubishi Diamond Scan 15VX 800/843-2515 http://www.mitsubishi-display.com	Oct 96	$410	78	good/ good	FEATURES: 13.8-inch viewable screen, 0.28mm dot pitch tube, up to 90-Hz refresh rate [1], Level 2b PnP ready [2], color and image correction software, three-year warranty, 8.5-hour weekday toll-free support. PRO/CON: Detailed text and graphics, ample on-screen menus; no degauss button to demagnetize the tube manually.	686
10	CLR VisionPro 15 800/611-1555 http://www.clrusa.com	NEW	$335	78	very good/ good	FEATURES: 13.6-inch viewable screen, 0.28mm dot pitch tube, up to 75-Hz refresh rate [1], Level 2b PnP ready [2], three-year warranty. PRO/CON: Lowest price on chart, letters and Web pages are easy to read, bright graphics, ample on-screen menus; finding menu items requires tedious button pushing, small viewable screen.	687

Best Buy For expanded reviews, visit http://www.pcworld.com/t10monitors. All products: 906

[1] Highest refresh rate at 800 by 600 resolution. [2] Level 2b Plug and Play monitors and graphics cards can communicate bidirectionally; Level 2ab uses Access.bus to enhance synchronization. However, Windows 95 doesn't fully utilize monitor Plug and Play.

HOW WE TEST Ten judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays typical business letters, spreadsheets, Web pages, and scanned images. The overall rating is based on price (30 percent), features and ease of use (25 percent), text and graphics quality (20 percent each), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

A GOOD 15-INCH MONITOR is not expensive—most Top 10 models cost less than $400. For instance, our new number two Best Buy, the $369 Hitachi SuperScan Pro 500, displays razor sharp text and graphics, and sports a full set of on-screen menus. The only trade-off: a small screen size. Also new this month is the $335 CLR VisionPro 15 in tenth place. Despite its generic design, the picture is rock steady and fine type is surprisingly crisp.

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WEATHER

LOS ANGELES

Monday

Partially cloudy and cool
55 / 69

Tuesday

Rainy and cool
60 / 66

NEWS [modify]

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Tim Allen, Dana Carvey, Dennis Miller, Kevin Bacon, Carl Reiner, ...

Digital maps of New England to make life easier for ...

Music

Online giants accused of copyright scaremongering

Rolling Stones to tour U.S.-British newspaper

Windham Hill Composer/Pianist Jim Brickman to Release Third Album 'Picture ...

Bone Thugs-N-Harmony Keep Promise to Take Tre to the Top ...

Regina Regina Release Debut CD on Giant Records New Duo ...

STOCK QUOTES [modify]

Quotes are provided by PC Quote. Data is delayed 20 minutes unless noted.

Company Symbol	(MSFT)	(T)	(IBM)	(ATVI)	(AAPL)	(NSCP)	($INDU)	(COMP)
Last Sale	79 7/8	39 1/8	151 7/8	10 3/4	22 1/2	54 3/8	6337.16	1283.04
Net Change	+ 3 1/8	0	+ 3 1/4	- 1 3/8	- 1/8	- 1 5/8	+ 28.83	+ 16.72
Time of Last	16:01	17:01	16:29	16:00	16:01	16:01	14:04	13:44

WEB LINKS [modify]

EarthLink	Sports	Entertainment	Finance	My Favorites
EarthLink Home	EarthLink Sports	Earthlink's Hollywood	EarthLink's Finance	UNIX Reference Desk
Daily bLink	ESPN	MovieLink 777FILM	Smart Money	News.com
The Arena	SportsLine USA	Hollywood Online	CNN Finance Network	Hotwired
The EarthLink Store	The Sports Network	Movie Reviews	NASDAQ	CNN
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Circle 85 on reader service card

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PC WORLD

TOP 10 GRAPHICS BOARDS

	GRAPHICS BOARDS	Month tested	Street price (1/9/97)	Overall rating	PC WorldBench graphics score	Comments	Reader service number
1	STB Velocity 3D 888/234-8750 http://www.stb.com	Feb 97	$199	101	187 very good	**FEATURES:** 4MB of VRAM, 120-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear interpolation, Mediamatics MPEG software, S3 Virge/VX chip. **PRO/CON:** Great performance, nice set of utilities, 4MB of fast memory good for graphical programs; mediocre AVI and MPEG video playback.	668
2	Matrox Mystique 800/361-1408 http://www.matrox.com/mga	Dec 96	$149	100	181 very good	**FEATURES:** 2MB of SGRAM, 130-Hz refresh rate at 1024 by 768, 3-D acceleration, optional MPEG and TV tuner cards, Compcore MPEG software, MGA-1064SG chip. **PRO/CON:** Best 3-D performance and quality, good AVI and MPEG video playback; refresh rates hard to set.	669
3	Diamond Stealth 3D 3000XL 800/468-5846 http://www.diamondmm.com	Mar 97	$254	99	184 very good	**FEATURES:** 4MB of VRAM, 120-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, Mediamatics MPEG software, S3 Virge/VX chip. **PRO/CON:** 4MB of fast memory for graphical apps, great software utilities, excellent AVI and video playback, easy installation; pricey.	670
4	Hercules Terminator 3D 800/532-0600 http://www.hercules.com	Dec 96	$119	99	184 very good	**FEATURES:** 2MB of EDO DRAM, 90-Hz refresh rate at 1024 by 768, 3-D acceleration, optional MPEG card, Xing MPEG software, S3 Virge chip. **PRO/CON:** Inexpensive, handles basic 3-D graphics well, excellent AVI and MPEG video playback, easy installation, toll-free support; poor documentation.	671
5	ATI 3D Xpression+ PC2TV 905/882-2600 http://www.atitech.ca	Jan 97	$189	99	180 very good	**FEATURES:** 4MB of SDRAM, 150-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, ATI MPEG player, ATI Rage II chip. **PRO/CON:** 4MB of memory lets you see more colors at high resolutions, connects to a TV, excellent AVI and MPEG video, flawless installation; 3-D quality is merely okay.	672
6	VideoLogic GrafixStar 600 800/578-5644 http://www.videologic.com	NEW	$149	99	189 very good	**FEATURES:** 4MB of MDRAM, 120-Hz refresh rate at 1024 by 768, bundled multimedia apps, bilinear video interpolation, Xing MPEG software, DirectVideo, Tseng Labs ET6000 chip. **PRO/CON:** Great price, very fast, excellent software utilities; no 3-D acceleration, AVI and MPEG performance are merely okay.	673
7	STB Lightspeed 128 888/234-8750 http://www.stb.com	Aug 96	$139	98	186 very good	**FEATURES:** 2.25MB of MDRAM, 120-Hz refresh rate at 1024 by 768, bilinear video interpolation, DirectVideo, Xing MPEG software, Tseng Labs ET6000 chip. **PRO/CON:** Slight price drop, performs well in business and graphics programs, perfect AVI video playback, excellent MPEG, lifetime warranty; no 3-D acceleration.	674
8	Hercules Dynamite 128/Video 800/532-0600 http://www.hercules.com	Mar 97	$139	97	186 very good	**FEATURES:** 4MB of MDRAM, 90-Hz refresh rate at 1024 by 768, bilinear video interpolation, Xing MPEG software, DirectVideo, Tseng Labs ET6000 chip. **PRO/CON:** Great price for a 4MB card, good performance all the way up to 1280 by 1024, easy installation; poor documentation, no 3-D acceleration.	675
9	Matrox Millennium 800/361-1408 http://www.matrox.com/mga	NEW	$269	97	187 very good	**FEATURES:** 4MB of WRAM, 120-Hz refresh rate at 1024 by 768, Compcore optional MPEG and TV tuner cards, MPEG software, DirectVideo, Matrox MGA-2064W chip. **PRO/CON:** Fast in business and graphics programs, superb AVI and MPEG video, great software utilities; expensive.	676
10	Diamond Stealth 3D 2000XL 800/468-5846 http://www.diamondmm.com	Feb 97	$179	95	184 very good	**FEATURES:** 4MB of EDO DRAM, 100-Hz refresh rate at 1024 by 768, Mediamatics MPEG software, S3 Virge chip. **PRO/CON:** All that RAM displays more colors at high resolutions and helps with 3-D effects; for $20 less, the 2MB board is also a good buy; video playback is just okay.	677

Best Buy For expanded reviews, visit http://www.pcworld.com/t10graphics. Windows 95 Plug and Play All products: 905

HOW WE TEST We tested PCI boards under Windows 95 with PC WorldBench 1.0 at 800 by 600 resolution and 16.8 million colors (reported here) and at 1024 by 768 and 65,536 colors. Boards were tested in a Dell Dimension XPS P133c with 16MB of EDO DRAM and 256K of pipeline-burst secondary cache. The overall rating is based on performance (40 percent), features (30 percent), price (20 percent), and support policies (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

IF MONEY IS NO OBJECT, check out the 4MB Matrox Millennium (last month's Millennium had only 2MB). We took a fresh look at this board after Matrox cut the price and released new drivers. At $269, it's pricey—but it installs easily, can handle all your programs, and plays video clips flawlessly. Also impressive is the sixth-ranked $149 VideoLogic GrafixStar 600, which we recently tested with 4MB. It's the fastest board on the chart.

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CPU by AMD Am5x86-P75

*10/31/96 evaluation by Ron Jarmuth, Chief Automation Technology Branch, HQDA–IMCEN, Pentagon Automation Technology Branch. Kingston Technology Company, 17600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 435-2600, Fax (714) 435-2699. © 1996 Kingston Technology Company. All rights reserved. Kingston is a registered trademark and Computing Without Limits and TurboChip are trademarks of Kingston Technology Company. Windows NT is a registered trademark of Microsoft Corporation.

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PC WORLD

TOP 10 MODEMS

	INTERNAL DESKTOP MODEMS	Month tested	Street price (1/15/97)	Overall rating	Average transfer time per MB (min:sec)	Comments	Reader service number
1	U.S. Robotics Sportster Voice 33.6 Fax-Modem 800/342-5877 http://www.usr.com	Feb 97	$179	79	2:32	**FEATURES:** 33.6-kbps, 8-bit card, stores multiple profiles, distinctive ring, full-duplex speakerphone, Caller ID, QuickLink Message Center voice/fax/data software. **PRO/CON:** Blazing performance, voiceless version also a great buy; installation confusing because modem isn't listed in Win 95's Plug and Play options.	658
2	Diamond Multimedia SupraFax Modem 33.6i PnP Faxmodem for Windows 800/727-8772 http://www.diamondmm.com	NEW	$179	79	2:48	**FEATURES:** 33.6-kbps, 16-bit card, FlashROM, stores multiple profiles, distinctive ring, Caller ID, COMit fax/data software. **PRO/CON:** Weekend tech support, thorough and clear documentation, above-average performance, SupraFax With Voice version also recommended; no security features.	659
3	Hayes Total Gaming Solution 33.6 770/441-1617 http://www.hayes.com	Nov 96	$189	77	2:47	**FEATURES:** 33.6-kbps, 16-bit card, voice mail, DSVD, Radish VoiceView, Quarterdeck Internet Suite 3.0 and Web Talk, speakerphone, distinctive ring, Caller ID. **PRO/CON:** Painless installation, $70 price drop raises its rank; still expensive, Hayes no longer offers toll-free tech support.	660
4	Logicode Quicktel 28800 V.34 DSVD 800/735-6442 http://www.logicode.com	Dec 96	$170	77	2:44	**FEATURES:** 33.6-kbps, 8-bit card, FlashROM, QuickLink Message Center voice/fax/data software, Radish VoiceView, lifetime warranty. **PRO/CON:** Great software package, upgrading is a cinch with FlashROM, above-average performance; we'd like to see more features (such as security) included at this price.	661
5	Motorola ISG VoiceSURFR 33.6 Fax 800/566-3266 http://www.mot.com/modems	NEW	$179	77	2:42	**FEATURES:** 33.6-kbps, 8-bit card, voice mail, full-duplex speakerphone, Caller ID, toll-free tech support, QuickLink Message Center voice/fax/data software. **PRO/CON:** One of the best performers we've seen; documentation thorough but technical, installation was not easy.	662
6	Zoom V.34I Plus Fax Modem 800/631-3116 http://www.zoomtel.com	Dec 96	$99	77	2:51	**FEATURES:** 33.6-kbps, 8-bit card, MNP-10EC cellular protocol, COMit and WinFax Lite fax/data software, stores multiple profiles, seven-year warranty, 14.5 hours of tech support on weekdays. **PRO/CON:** Least-expensive modem on the chart; middle-of-the-pack performance, installation was tricky.	663
7	Practical Peripherals Internal 33.6 Voice/Data/Fax Modem 770/840-9966 http://www.practinet.com	NEW	$159	76	2:58	**FEATURES:** 33.6-kbps, 8-bit card, distinctive ring, stores multiple profiles, password protection, Caller ID, Practical Message Center voice/data/fax software. **PRO/CON:** Includes a microphone, flawless installation, lifetime warranty; installation guide was the only documentation, slowest modem listed here.	664
8	Boca V.34 Boca Office Communicator 561/997-6227 http://www.bocaresearch.com	Nov 96	$199	75	2:51	**FEATURES:** 28.8-kbps, 16-bit card, voice mail, VoiceView, full-duplex speakerphone, Faxworks 3.0 fax/data software, five-year warranty, tech support available 10.5 hours per weekday. **PRO/CON:** Very good software bundle; most expensive modem on the chart, slow, full-length card may be hard to fit in some PCs.	665
9	E-Tech Bullet PC288MX 800/328-5538 http://www.e-tech.com	Nov 96	$129	75	2:42	**FEATURES:** 28.8-kbps, 8-bit card, COMit Lite for Windows and WinFax Lite fax/data software, two-year warranty, toll-free tech support, overnight replacement. **PRO/CON:** Above-average speed, attractive price; minimal documentation, no security or upgradability features, installation not for novices.	666
10	Hayes Total Internet Solution 33.6 770/441-1617 http://www.hayes.com	Nov 96	$129	75	2:54	**FEATURES:** 33.6-kbps, 16-bit card, distinctive ring, Quarterdeck Internet Suite 3.0 and Web Talk, SmartCom LE fax/data software. **PRO/CON:** $34 price drop, good for Internet beginners; sluggish performer, meager documentation, Hayes no longer offers toll-free tech support.	667

Best Buy For expanded reviews, visit http://www.pcworld.com/t10modems. Windows 95-certified Plug and Play All products: 904

HOW WE TEST We test a pair of identical modems on a simulated phone network. For the phone line test, we send a text file over 55 line conditions. For the file type test, we send five files—graphics, text, program, and compressed, plus a mixture of those four file types—over one line condition. We then average the results of the two tests. Overall rating is based on performance (43 percent), features (26 percent), price (12 percent), support (10 percent), and ease of use (9 percent). Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

THE U.S. ROBOTICS Sportster Voice 33.6 Fax-Modem stays at number one this month, despite a strong showing from Diamond Multimedia's new SupraFax Modem 33.6i PnP. Motorola's ISG VoiceSURFR 33.6 Fax didn't perform as well as its 28.8-kbps predecessor, and the Practical Peripherals Internal 33.6 Voice/Data/Fax Modem's kitchen-sink approach to features puts it on the chart despite mediocre performance and meager documentation.

Loca... and rem...

Grab the case with both hands and remove it. Avoid damaging any parts.

Locate the memory sockets (they may be under the power supply).

... any wires ... it may be ...

Gently insert memory into appropriate slot ensuring that it is seated properly.

Locate cache sockets. You may have to clear additional wires or expansion cards.

Gently insert cache into ... ensuring that it is seated properly.

...nect and remove the ... positioned on ...

Configure jumpers or dipswitches to modify CPU bus speed. Refer to manufacturer specs.

Check to make sure that CPU is properly indexed before inserting.

Be sure pins on the CPU are properly aligned before inserting into the socket.

Resecure the fan on top of the CPU, making sure to reconnect the wire securely.

...e for internal drive. ... an external drive cage ... supply.

... the screws of the internal ... or lift the cage

Place the internal drive in the cage.

Place the cage assembly into the chassis.

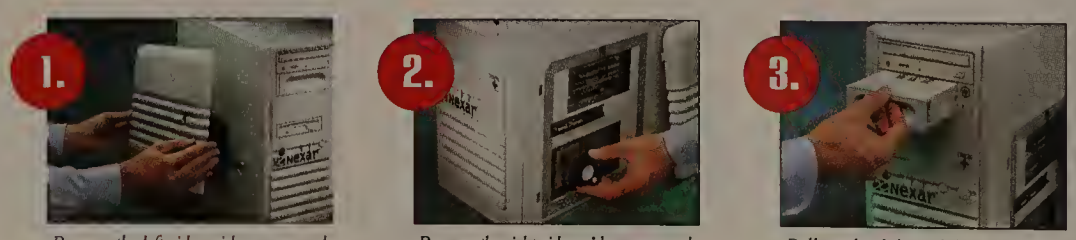
Resecure the sc...

Resecure any expansion cards you may have removed and push wires back into position.

• Resecure the case on the chassis. Make sure not to pinch wires or damage parts.

... PU does ... sure pro...

We've taken some unconventional steps to make our PCs easy to upgrade. Three to be exact.



Remove the left-side quick access panel to add to expansion slots.

Remove the right-side quick access panel to install CPU, cache and RAM.

Pull out hard drive slide, insert drive and close. You're done.

A high-performance PC that literally upgrades in seconds? Without tools? Without training? Either we're kidding, or we're NEXAR. Unlike conventional PCs, the NEXAR PC puts the CPU, cache, memory, hard drive and expansion slots right under your fingers. You don't even take off the cabinet. Just pop the side panels and slide out the hard drive caddy for instant configuration and instant upgrades. It's that simple.

As for performance, the NEXAR PC passes benchmark tests with flying colors. And when it comes time to upgrade, Nexar makes it easy — because the NEXAR PC not only accepts current industry standard components, it's ready for the future because it supports Universal Serial Bus, SDRAM and Pentium® processors with MMX™ technology. Why waste money on a computer without a future? To find out about the NEXAR PC, or obtain a copy of the latest benchmark performance test scores contact NEXAR at the number or web address below. Or contact the nearest NEXAR reseller. And take a few steps toward preserving your computer investment.

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SMALL Office Home OFFICE

FROM HIGH-RISE TO HOME: HOW TO SET UP A SMALL OFFICE THAT WORKS.

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Cheap hi-res printers, free e-mail, and more.

EDITED BY
Michael S. Lasky
ILLUSTRATIONS BY ROSS MACDONALD
PHOTOGRAPHS BY KEVIN CANDLAND

Smart Phones, Smart Business

The right phones and services can convince your clients you have a corner office on the 50th floor. Here are the ones you need.

BY MICHAEL S. LASKY

YOU MIGHT GO TO work in a three-piece suit, or your pj's. You might have a suite in a high-rise, or set up shop on a kitchen table. To the outside world, that won't be noticeable—with the right phones.

For small and home-based businesses, the telephone is the great equalizer. The problem is figuring out what phone equipment and services to get. These days, PCs can handle many phone chores, but which should you use? How many phone lines do you need? Are Caller ID and Call Forwarding worth the fees? What's the best hands-free phone option: speakerphones or headsets? And how do you keep track of calls and faxes on the road? So many questions, so little time. Here are some answers. Let's start with the basics.

Q. HOW MANY PHONE LINES?

A. Every small office should have at least three phone lines: two for voice and a third for fax/modem. If you operate out of your home, you particularly need to divide your personal calls from the business ones. When clients get your voice mail, the *last* thing you want them to hear is "Hi, you've reached the Smith family—we can't come to the phone..."

And get a separate line dedicated to your fax machine and modem. That way, you can receive a fax, send e-mail, or surf the Net without tying up your voice line.

You should be able to use your business line throughout your home, but it shouldn't ring outside the office. This will let you make outgoing calls while eating lunch or taking an *Oprah* break, but it won't disturb you or your family with business calls at odd hours. Likewise, the personal or house line should be available but not ring in the office.

What if your business grows and you add employees? According to the U.S. Small Business Administration, a good rule of thumb is to add one line per employee if they each spend at least a third of their time on the phone.

With six employees or more, it's time to consider a Private Branch Exchange system. A PBX can handle phone, fax, and modem lines, and lets you customize each extension with voice mail, intercom, speed dialing, and other fea-

tures. Best of all, you can add more lines or extensions as you need them, with little reconfiguring.

You can lease a PBX system from your local phone company, but you might save money in the long run by buying one outright. PBX setups for 8 to 16 extensions cost from $1800 to $3600.

Q. WHICH SERVICES SHOULD I CHOOSE?

A. Each local telephone company offers a slew of custom calling services. Most services cost about $3 to $5 per month; the most useful for small businesses are Call Forwarding, Call Waiting, and Caller ID—especially when used in tandem with a computer-based phone.

Call Forwarding lets you automatically send all incoming calls to another number—essential if your work takes you to other locations and you don't want to miss any calls to the office. Other flavors of this service let you redirect calls from the field or send calls to another number while you're using your primary line.

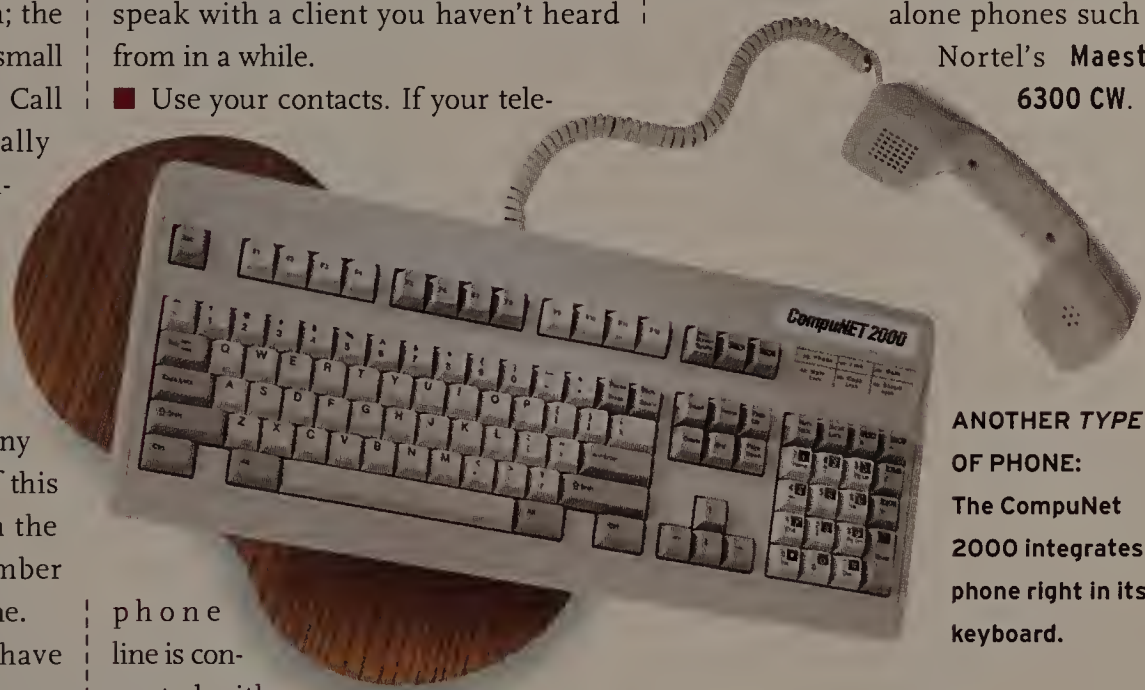
Call Waiting signals that you have another incoming call when you're on the phone. For businesses with just one line, it creates a virtual second line. But the downside of Call Waiting is that it's easy to accidentally hang up on a caller, and your clients may not appreciate having their calls interrupted.

Caller ID displays, between the first and second rings, a caller's name, area code, phone number, and the date and time of the call. To take full advantage of this service, you'll need a Caller ID–enabled phone and telephone-savvy software. With the right equipment, Caller ID lets you perform some crafty sleight of hand. For example, you could:

- Screen calls. You might not want to talk with that aggressive office supply salesperson, but perhaps you do want to speak with a client you haven't heard from in a while.
- Use your contacts. If your telephone line is connected with your PC, a contact manager like Starfish Software's **Sidekick 95** or Symantec's **Act** can read the Caller ID data and automatically display the appropriate card file as your phone rings. Then impress your clients with your photographic memory: "Hi, Joe. So how's your wife Ruth and your son Charlie? Hey, didn't you order 100 cases of Spam six months ago?"
- Create a virtual receptionist. Combine Call Waiting with Caller ID, and you can have your software screen each call, forward it to another telephone number or to voice mail, or have an automated attendant ask the caller to hold—all while you're engaged in another call. You can also get these features with some standalone phones such as Nortel's **Maestro 6300 CW**.

COST CUTTER'S TIP #1

If your fax/modem line is mainly used for incoming calls, consider measured rate (residential) service. It costs half as much as regular basic service. The downside: You'll be charged for any outgoing calls exceeding your monthly allotment.



ANOTHER *TYPE* OF PHONE: The CompuNet 2000 integrates a phone right in its keyboard.

Q. SHOULD I LET MY PC DO THE DIALING?

A. The answer here really depends on the size of your company and on your work needs. These days, many Windows 95 computers do double duty as Ernestine the Operator—they can maintain your address book, handle faxes, route calls, take messages, and even autodial clients.

PC-based phone systems are best for firms that require call management—such as tracking who made a call, its length, which project it should be billed to, and which clients have called you.

If you've recently bought a major-brand system such as a Compaq Presario, Hewlett-Packard Pavilion, IBM ▶

Escape From Voice Mail Hell

EVERYONE HAS a favorite trapped-in-voice-mail-hell story; don't let one of them happen to your clients. A smart outgoing message makes life easier for you and your business. Remember the three Be's of messages:

Be Short. Nothing infuriates a caller more than being held captive to a long-winded outgoing message. Remember, the client is calling to *talk* to you, not to hear you prattle on.

Be Direct. If you need to give extended voice mail instructions, provide a quick escape hatch: Tell callers how they can reach a live person—or just skip the message entirely.

Be Sincere. Welcome callers to your company, but don't depend on trite, worn-out phrases. For example, saying "your call is valuable to us" will likely be considered by callers as more patronizing than sincere.

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actor
actress

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Aptiva, or Micron MPC, you probably already have a full-fledged office telephone system built in. If not, you can add a multifunction telephony board to the multimedia PC for between $200 and $300. These are basically modems that take advantage of a computer's sound card capabilities—using the speakers and a microphone or a headset instead of an actual telephone receiver. Examples of the current crop of telephony boards include Aztech Labs' $199 **AT3000** (800/886-8859) and U.S. Robotics' $210 **Sportster Voice 28.8 Faxmodem with Personal Voice Mail** (888/473-7367).

INFO CENTRAL: Lucent Technologies' $180 speakerphone lets you enter appointments and contacts with its keyboard.

For people who work almost exclusively at their computers, there's Integrated Technology USA's $240 **CompuNet 2000**, a computer keyboard that comes with a telephone handset built in (the numeric keypad doubles as the telephone dial). CompuNet also includes call logging software, an automatic dialing directory, and Internet phone capability.

COST CUTTER'S TIP #2

If you subscribe to more than one custom calling service feature, ask about package deals. Most local telephone companies offer a much lower rate for combining services.

But PC-based phone control is definitely not for everyone. In most cases, if you want it to take messages or handle faxes during off hours you'll need to leave your computer on all the time. (Almost all laptops and a few desktop models *do* have a sleep mode that responds to "wake-up" calls, however.)

Recording voice messages takes a considerable amount of CPU horsepower and memory; when a message comes in, whatever application you're running at the time may slow to a crawl. The messages, which are saved as .wav files, can consume up to 1.3MB of hard disk space per minute, even with compression.

Finally, if your computer breaks down, so does your phone system. You'll want to keep a spare phone and possibly an old answering machine on hand, just in case. Or you could use a device such as Global Village Communications' $239 **TelePort 33.6 Speakerphone Edition for Windows**. This clever PC peripheral/phone speaker attaches between your phone and a computer, giving you the best of PC phone/fax/modem control and offline speakerphone support: With the computer off, it transforms your telephone into a regular speakerphone; with the computer on, the PC software lets you integrate faxes, e-mail, up to 1000 voice mailboxes, and modem functions.

Q. WHAT ABOUT STAND-ALONE PHONES?

A. There's a wide range of multifunction telephones that can do many of the things a PC-based phone can do, for much less money. If an employee doesn't need a multimedia computer on their desk, a full-featured phone and some custom calling services can easily do the trick.

For example, Nortel's $270 **Meridian 9516** is sure to give your professional image a shine. The Meridian integrates a two-line speakerphone with a digital answering machine that features up to a dozen different voice mailboxes. Used with Caller ID, this full-featured desktop phone lets you create up to 75 different outgoing messages, so regular clients can enjoy a personalized greeting. Other productivity enhancers include extra jacks for headsets and fax machines, and automatic call detection that distinguish- ▶

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NEC PRESENTS THE SUPERSCRIPT™ 860 LASER PRINTER. When it comes to computer equipment, small business owners don't expect to get what they pay for. They expect to get a lot more than what they pay for. And that's exactly what the NEC SuperScript 860 delivers. At a new low price of $449*, it offers outstanding 600 dpi resolution, as well as a long list of features you'd normally find on printers costing twice as much.

Say you've got a proposal due tomorrow. No problem. The SuperScript 860 can quickly print everything from your transparencies to a proof sheet that lays out your entire proposal. Combined with the Solutions CD we've included, the SuperScript 860 will help you to create a clean professional look.

- *8 pages per minute*
- *True 600 dpi with NEC Sharp Edge Technology*
- *Adobe Memory Booster™*
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- *LANCruiser™ plus networking box option*
- *200-sheet paper capacity*
- *Proof sheet (n-up) printing*
- *Custom watermark capabilities*
- *2-year overnight warranty**
- *Plus much more*

This winner of 10 major awards, including *PC Magazine*'s Editors' Choice, is now available with the NEC LANCruiser plus networking box option, turning your SuperScript 860 into a powerful networking printer. And considering this is the first printer ever to offer Adobe® PrintGear™ technology, it's truly the perfect laser printer for those whose expectations are higher than their budget.

Just call 1-800-NEC-INFO to find out more about the NEC SuperScript 860, or visit our web site at http://www.nec.com.

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PC WORLD BEST BUY

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The NEC SuperScript 860 is available at CompUSA, Circuit City, Best Buy, Staples, Computer City, Fry's Electronics and Micro Center.

*Estimated street price. Dealer prices may vary. Some restrictions apply to the overnight replacement warranty. For more information, ve tax, call NEC FastFacts™ at 1-800-366-0476 and request document #778600. SuperScript is a trademark of NEC Corporation. FastFacts, LANCruiser and "See, Hear and Feel the Difference" are trademarks of NEC Technologies, Inc. All other trademarks or registered trademarks are property of their respective owners. ©1997 NEC Technologies, Inc.

Circle 163 on reader service card

es voice from fax calls, which is particularly useful if you lack a separate data line.

For a phone with computer-like smarts, check out the **Lucent Technologies Personal Information Center 882.** This $180 speakerphone features a small keyboard and an eight-line LCD, along with enough internal memory to store up to 200 names and numbers, as well as addresses and birth dates. It even lets you set visual and audio alarms for appointments and tasks on your to-do list. There's no answering machine, but if you already have voice mail from your telephone company, a flashing light alerts you to waiting messages.

LOOK MA, NO HANDS: Three ways to talk hands-free are (left to right) Hello Direct's cordless headset, Polycom's speaker, and Global Village's speakerphone.

Of course, the Personal Information Center, like most speakerphones, can make you sound like you're calling from a pay phone on the planet Remulo—distant and hollow. And the conference room telephones that offer 360-degree pickup and simultaneous two way conversations are expensive: Prices start at $800.

COST CUTTER'S TIP #3

If your home-based business won't need a Yellow Pages listing, order residential service instead of a business line. Some phone companies charge up to three times more for business services.

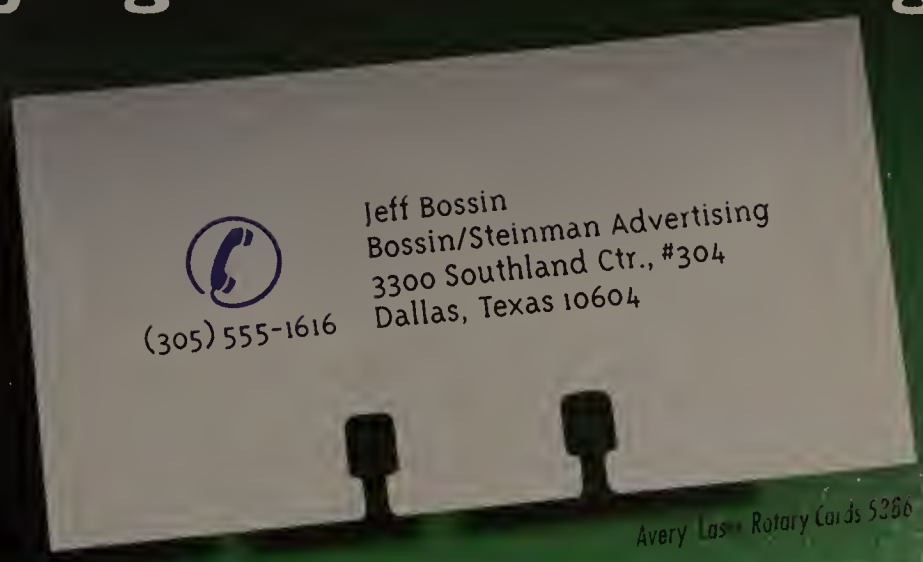
Luckily, Polycom has come to the rescue with its $299 **SoundPoint.** Designed for the SOHO market, this modular speaker attaches to any phone for both hands-free conversations and teleconferences. Everyone in the room will sound like they're talking from a regular handset. U.S. Robotics' $399 **ConferenceLink CS1050** works the same way, but has more multidirectional microphones, which means it can handle participants in a larger room.

With speakerphones, you can't roam too far. But cordless phones let you talk with no wires attached—they're perfect for that trip to the filing cabinet or the refrigerator. But be sure to avoid cheap models that operate on radio frequencies of 46 to 49 MHz—their range is limited. And electrical appliances as well as fluorescent lights can interfere with the signal. A 900-MHz phone lets you wander farther from the base unit and offers hundreds of channels on which to transmit (versus just 10 to 25 for the 49-MHz models), which makes your conversations safer from eavesdroppers. You can find feature-loaded sets for under $200.

Nortel's versatile, top-of-the-line, and cordless **Maestro 6300 CW** integrates with Caller ID and Call Waiting services. If you're on a call and another one comes in, you can respond to the waiting party by redirecting the call to voice mail, activating a "please hold" message, forwarding the call to another number, or taking both calls simultaneously for an instant teleconference. The $250 Maestro's speakerphone base includes a dialpad, so you can still make calls if your handset battery runs dry.

Headset attachments are very useful if you need your hands free to take notes or fill in forms. Alas, most headsets are wired to your phone, tethering you to your desk. If you want to free up your feet as well as your hands, Hello Direct offers the $369 **HelloSet Cordless 100**, which lets you move up to 100 feet from your phone without feeling like a marionette. A 50-foot version costs $299. ▶

"I was going to update my contacts, but frankly, my dog has better handwriting."



Why not get Fido to do it? He's busy napping. Anyway, why would you want handwritten rotary cards? Now you can output Avery rotary cards on your laser or ink jet printer. Preset layouts in Microsoft Word, WordPerfect and LabelPro make it easy. So, you ask, "How will all this affect *my* life?" Put it this way, if you had a tail, you'd be wagging it.

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Act $199, Symantec, 800/441-7234, www.symantec.com
READER SERVICE NO. 744

CompuNet 2000 $240, Integrated Technology USA, 201/907-0200, www.ITI2000.com
READER SERVICE NO. 745

ConferenceLink CS1050 $399, U.S. Robotics, 888/473-7367, www.usr.com
READER SERVICE NO. 746

HelloSet Cordless 100 $369, Hello Direct, 800/444-3556, www.hello-direct.com
READER SERVICE NO. 747

Lucent Technologies Personal Information Center 882 $180, Lucent Technologies, 800/222-3111, www.lucent.com
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Maestro 6300 CW $250, **Meridian 9516** $270, Nortel, 800/466-7385, www.nortel.com
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Sidekick 95 $49, Starfish Software, 888/782-7347, www.starfishsoftware.com
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SoloCall $495, SoloPoint, 408/364-8850, www.solopoint.com
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SoundPoint $299, Polycom, Inc., 800/765-9266, www.polycom
READER SERVICE NO. 752

TelePort 33.6 Speakerphone Edition for Windows $239, Global Village Communications, www.globalvillage.com
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For information on all products in this article, circle reader service no. 912.

Q. HOW DO I MANAGE MY PHONES FROM THE ROAD?

A. If you're an entrepreneur who travels frequently, you may want to consider a *virtual office exchange.* This computer-based telephone service literally follows you from place to place, letting you manage faxes and voice calls from almost anywhere.

When you sign up, you tell the exchange which numbers you regularly use (office, home, cell phone, and so on). You can also tell the exchange which numbers to try when it needs to reach you. So, for example, you could order it to ring the office phone first, the cellular phone next, then home, and finally forward to voice mail. The caller would hear an automated message to please hold while the system tries to find you at each phone number you've listed.

If you have Caller ID, you can set up a different "follow me" routine for each selected incoming number—business or personal. If there is no answer at any of the numbers, the exchange can send the caller's number to your pager. Once the exchange has found you, you can screen the call and decide whether to take it or reroute it to another number or voice mail. The systems also distinguish between faxes and voice calls and can let you set up conference calls from whatever you happen to be.

There are half a dozen virtual office service providers, but the least expensive is **Avox** from Avirnex Communications Group (http://www.avirnex.com). The Avox service costs $19.95 a month and assigns a single number for your office, fax, pager, cellular phone, and voice mail. A similar service, **MCI One** (http://www.mci.com/mcione) from telephone giant MCI Communications, also costs $19.95. MCI One assigns separate numbers for voice, fax, and mobile phones. If you don't want to pay monthly fees, you can plunk down $495 for SoloPoint's **SoloCall**, which puts its phone management power in an external computer peripheral box about the size of your average modem. But the product does not work with a PBX system, only with dedicated single phone lines.

Whether you're just starting out with a single line and that rickety card table, or you have a growing company with 50 employees, there is a specialized phone gizmo or service that will make your job easier and more productive. And ordering it is...just a phone call away.

Michael S. Lasky is a senior associate editor at PC World. ▶

Behold the elusive "You'd never know what was stuck here a second ago." laser label.

(Not Shown) Avery Remove'Em Laser Labels 6464

Here today. Or gone tomorrow. Avery Remove'Em Labels stay in place for the long haul. But they can be removed or repositioned easily. Preset layouts in Microsoft Word, WordPerfect and LabelPro do most of the work for you. And they glide through laser or ink jet printers and come out looking spiffy. You should've seen the one that used to be on this binder.

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Hot Picks for the Home **Office**

These are a few of our favorite things.

EPSON'S STYLUS COLOR 600 offers inexpensive high-resolution printing.

BY STEVE BASS

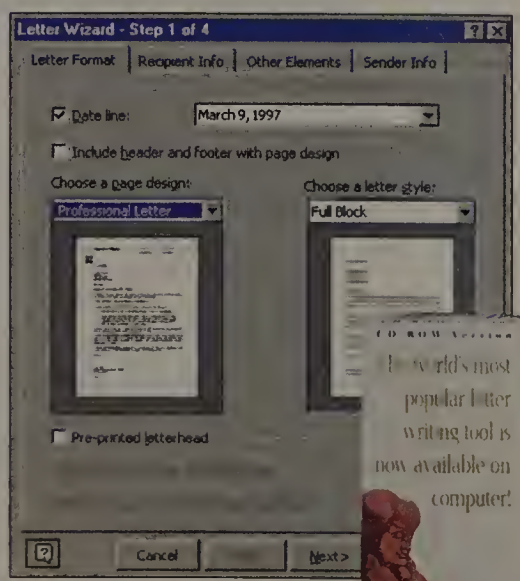
FAST, SHARP COLOR PRINTING

ISN'T IT TIME your business had a color printer? Color adds sizzle to your brochures, makes your correspondence snappier, and brings life to your business cards. Good news: Now you can get a photo-quality color printer without spending a bundle. The hottest new machine from Epson delivers razor-sharp resolution in both monochrome and color for less than $300. Epson's Mac/PC compatible Stylus Color 600 prints at 1400 by 720 dots per inch (for comparison, my year-old HP LaserJet 5P prints at only 600 dpi). Photos look like, well, photos. Print speeds are just as impressive: 6 pages per minute in black and white, 4 ppm in color, and the paper tray holds 100 sheets. Want color? So what are you waiting for? **Epson Stylus Color 600** $299 list; Epson America; 800/289-3776, 800/ 442-2110 (fax-back); http://www.epson.com

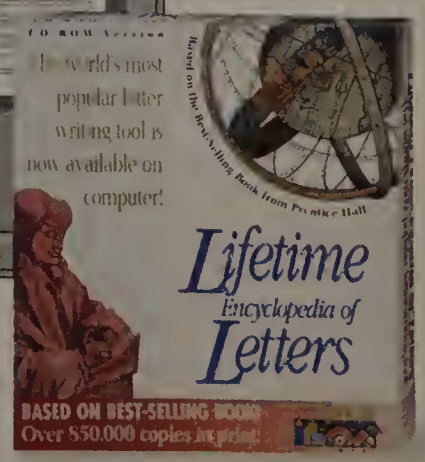
TAKE A LETTER, ANY LETTER—PLEASE

HERE'S MY BUSINESS secret: I don't write my own letters anymore. With the Lifetime Encyclopedia of Letters, I get to choose from over 850 already written business letters. In a flash, I can search through a database of missives, pick one for, say, a personnel evaluation, or just pluck out the two or three sentences I need. Then I insert them directly into my word processor and no one's the wiser. The collection ranges from documents requesting favors ("Dear Neighbor, Can you please not use the lawn mower before 8 a.m.?") and making complaints ("Dear Neighbor, Stop mowing the lawn so early in the morning!") to letters of thanks, sympathy, apology—even fund-raising letters. Lifetime Letters comes on a CD-ROM or floppy disks, and includes the Lifetime Encyclopedia of Letters in a hardbound edition (you know—on paper). **Lifetime Encyclopedia of Letters** $39.95 list; Street-Wise; 800/743-6765, 310/829-7827, 310/ 828-8258 (fax).

READER SERVICE NO. 738

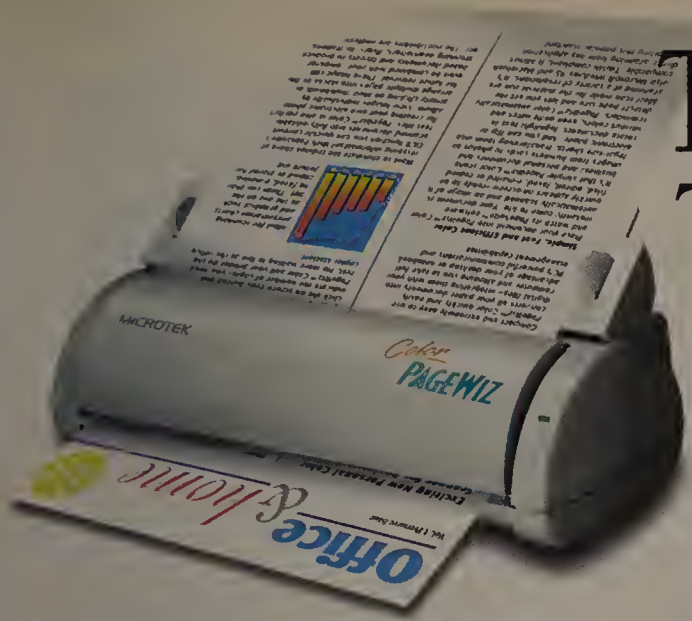


TAKE A LETTER: Customize any of some 850 ready-to-go letters from the Lifetime Encyclopedia of Letters.



QUICK NET ACCESS, NO HEADACHES

POP QUIZ: What makes Web browsing fast and fun but is so complicated to install it'll give you a headache? That's right, a speedy ISDN phone line. (Integrated Services Digital Network is a technology that lets you access the Internet at more than four times the speed of a typical 28.8-kbps modem.) Getting ISDN installed means figuring out how to use a special modem and hassling with both the phone company and your Internet provider. (I know. I have ISDN and have experienced the grief.) But with EarthLink's new ISDN service, you can order an ISDN modem (known as a *terminal*), the phone line, and Internet service with one phone call. EarthLink contacts your local phone company to place the order, ships you ▶



The Little Color Scanner That Thinks It's An Office Manager.

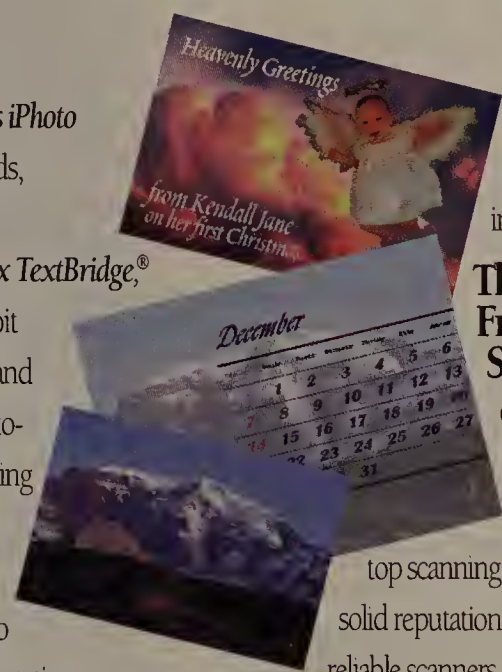
Scan in Beautiful 24-bit Color. Save, Annotate or Route Documents to Fax, E-Mail and Printers.

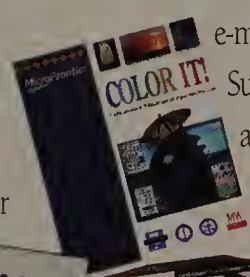
If you're buried under a mound of documents you have to sort through, save, file and route every day, then get the new, very affordable *Microtek Color PageWiz*™ page scanner. Color PageWiz captures photos, drawings, business cards, magazine articles, reports, legal briefs — virtually any business document — and places them right into your computer.

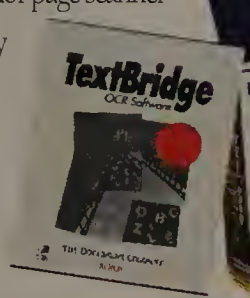
Aggressively Priced Yet Fully Loaded.

Only Microtek could offer a color page scanner with such superb image quality for just $199 and still pack it with some spectacular software. For example, Windows models of Color PageWiz include *Xerox TextBridge*® OCR software for scanning pages of text, *Xerox Pagis*® for document management and routing scanned documents to your fax or e-mail software, and *Ulead's iPhoto Express*™ for making greeting cards, calendars and announcements.

Macintosh models include *Xerox TextBridge*,® *MicroFrontier's Color It!* the 32-bit image-editing and paint software and *Microtek's new PageSuite*,™ easy-to-use, drag-n-drop software for routing scanned documents to your fax, e-mail software. PageSuite for Macintosh also allows you to add annotations, highlights, enhancements or special effects to all the documents you scan.







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the modem, and provides Net access, as well as tech support during the phone line's installation. EarthLink offers three terminal models with prices that are comparable to discount stores. The price doesn't include your phone company's monthly and per-call surcharges for ISDN service. **ISDN Internet Access** $34.95 per month for 100 hours plus $25 activation; EarthLink; 800/395-8425, 818/296-2467, 818/296-4130 (fax); http://www.earthlink.net

READER SERVICE NO. 739

SMALL OFFICE, BIG SOFTWARE

THE PROBLEM with software office suites is that you usually get saddled with extra products that you'll never use. Surprise, surprise—Microsoft has actually been listening and has designed a software suite specifically for the SOHO crowd. The Microsoft Office 97 Small Business Edition includes Word, Excel, Publisher, Outlook (its new information manager), Automap Streets Plus, and Small Business Financial Manager. The package has some bonuses. If you've ever thought of creating a Web site for your business, now's your chance: Publisher includes a handy Web Site Wizard. And the Financial Manager comes with an array of templates, including ones that let you create a business plan and cash flow projections, as well as "what-if" wizards. Internet Explorer, Microsoft IntelliMouse, and a month's worth of The Microsoft Network are thrown in for good measure.

The downside? The Small Business Edition runs exclusively on Windows 95, and you will need at least 16MB of RAM if you want to run multiple applications. **Microsoft Office 97 Small Business Edition** $400 list, upgrade $249 list; Microsoft; 800/426-9400, 206/882-8080, 206/936-7329 (fax); http://www.microsoft.com/office/

READER SERVICE NO. 740

EASY RIDER: Levenger's CPU Trolley makes moving a computer easy.

FAXPAL: WITH OR WITHOUT A PC

A FRIEND OF MINE is taking a stab at being a solo entrepreneur. One economy: He's using the computer's fax-modem instead of a dedicated fax machine. Trouble is, my friend does not like leaving the PC on 24-hour call. My recommendation? InfoImaging's FaxPal. This modem-size gadget hooks between your computer and your telephone line and stores faxes that come in when your PC is off. You can view the faxes on your computer or print them out on a nearby fax machine. With the included 3D FaxFile software, you can compress faxes into a fraction of their original size and fax or scan them in this secure format to another PC that can decompress them. FaxPal's 512K of memory saves 15 to 20 pages of standard text. If you expect a deluge of faxes, you can add up to 4.5MB for storing 180 pages. **Infoimaging** $179 list; 800/966-1140; http://www.infoimaging.com

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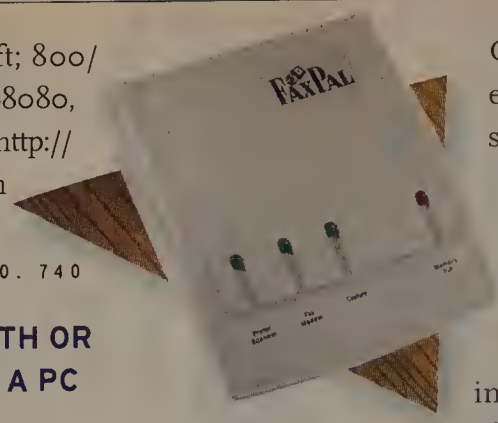

INFOIMAGING'S FAXPAL receives and stores faxes even when your PC is powered off.

A MOVING EXPERIENCE

for years my small-office problem could be summed up in four words: big computer, tiny desk. So when I went shopping for a new PC, I vowed to forget the desktop models and go with a minitower I could put under my desk. It was a great solution—until I wanted to plug a new gadget into the back of the system. I had to crawl under my desk with a flashlight, and ended up banging my head in the process.

I sure wish I had known about the CPU Trolley from the Levenger catalog. This handsome wooden trolley sports sturdy coaster wheels and rolls easily under a desk. It fits CPU towers up to 8 inches wide and comes in either natural or dark cherry veneer. Now when I want to plug in a new mouse or just move the computer when I'm cleaning my office, I can wheel the CPU tower about with ease—giving a whole new meaning to the term "mobile PC." **CPU Trolley** $139 list; Levenger; 800/544-0880; http://www.levenger.com

READER SERVICE NO. 742

E-MAIL FOR THE MASSES

EVER CONSIDER using e-mail as a marketing tool? Not for "spamming" (like junk mail) but for, say, telling clients about a new service, listing rate changes, or just staying in touch. (For example, I send my PC user group's monthly agenda electronically to over 500 members.) The problem: Sending e-mail to more than a few people is arduous and time-consuming. The solution: NetMailer, an ingenious Internet e-mail program that handles bulk mail chores with panache. To start with, it personalizes each message—salutation, subject, and content specific to the recipient—by combining data from a built-in database. And it imports data from existing mailing lists or databases, including plain text, Act, dBase, Eudora, and Paradox aliases. The program provides a built-in spelling checker and lets you easily attach a document to the message. You can try NetMailer right now by downloading a trial version from the vendor's Web site. **NetMailer** $99 list; Alpha Software; 617/229-2924; http://www.alphasoftware.com

READER SERVICE NO. 743

Steve Bass is a PC World *contributing editor.*

For more information on all products in this article, circle reader service no. 911. ■

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Now picture this:

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8MB of EDO DRAM expandable to 40MB
6X CD-ROM and 3.5" floppy drive
NiMH battery

SATELLITE PRO 430CDS*/430CDT

11.3" dia. color dual-scan DSTN display (CDS)
11.3" dia. color active-matrix TFT display (CDT)
120MHz (2.9v) Pentium processor, 16KB cache
1.35 billion byte (=1.26GB) hard disk drive
16MB of EDO DRAM expandable to 48MB
Modular 10X** CD-ROM and 3.5" floppy drive, swappable in the SelectBay™
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ALL MODELS

800 x 600 resolution
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VL local-bus video
16-bit Sound Blaster® Pro compatible audio system
Two stacked PC Card slots (two Type II or one Type III)
IrDA compliant infrared port
Accupoint™ integrated pointing device
Integrated AC adapter
Optional NoteDock™ Enhanced Port Replicator
Windows® 95 or Windows for Workgroups included
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PENTIUM PROCESSOR
A powerful processor and up to 40MB of EDO memory can speed up any multimedia presentation.

11.3" DIA. COLOR DISPLAY
With 800 X 600 resolution, this massive display delivers crystal-clear definition and vibrant colors

EXPANSION CAPABILITIES
Two PC Card slots unlock a world of expansion capabilities. And the optional NoteDock Enhanced Port Replicator offers additional PC Card slots as well as easy connection to your desktop setup

ADVANCED MULTIMEDIA
CD-ROM, full-motion video and a 16-bit Sound Blaster Pro compatible sound system give you advanced multimedia performance at a great value.

© 1997 Toshiba America Information Systems, Inc. All prices, specifications and availability are subject to change. †Price is for 200CDS model, price of 430CDS model begins at $1999, price of 430CDT model begins at $2999. *The 200CDS and 430CDS are sold at selected resellers as the 205CDS and 435CDS with Windows 95 and additional pre-installed software. **10X average speed. All products indicated by trademark symbols are trademarked and/or registered by their respective companies. Intel Inside and Pentium Processor Logos are trademarks of Intel Corporation.

In Touch with Tomorrow
TOSHIBA
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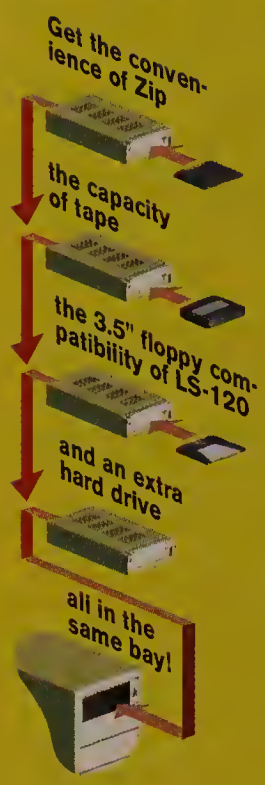
An unsolicited

Nestimonial. I'm a normally quiet accountant but I'm just "blown away" by how convenient it is to back-up annual financial statements on tape and still be able to send them on Eagle™ Nest™ Zip™ to my corporate headquarters. And I don't have a bunch of external peripherals cluttering up my desk.



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PC WORLD @HOME

Voice Mail/Fax Combo, Under-$200 Printer

CENTRAL COMMUNICATIONS

EVER THOUGHT IT WOULD be useful to have a receptionist in your home? Now you can. IBM's $399 **ComCentral 33.6**, a petite number, will take care of all your communications. It's sort of an external 33.6-kbps fax-modem and answering machine rolled into one. The device handles two telephone lines and directs calls to two voice mailboxes or to a menu of outgoing messages. Better than a fax card, ComCentral is able to receive faxes while your computer is turned off. And when you travel, it will act as your home-base secretary: Call it to have your faxes forwarded to another computer or fax machine, have it page you when you receive messages, or have your calls transferred to another phone. ComCentral isn't cheap, but then, good help seldom is.

—*Christina Wood*

ComCentral 33.6

GRADE: **B**; PRICE: $399 list; Options by IBM; 800/426-2968; http://www.pc.ibm.com/options

BLAST FROM THE PAST

KIDS WHO LOVE dinosaurs will eat up **Dinosaur Explorers**, an interactive CD-ROM of fun and games with education thrown in. Enter the Dinosaur Club (the main interface) for a gallery of dino-themed activities. Click any of the ten pictures on the wall, and you're whisked into the past to meet animated dinosaurs, each accompanied by fact-filled sound clips and amusing sight gags. Or choose one of the excellent games and puzzles—such as the Colossal Fossil Dig, where you uncover and assemble dinosaur skeletons. This title has too little original animation, but kids will like the cartoons. The CD-ROM is recommended for ages 4 to 12, but it will hold the interest of older kids, too.

—*Richard Jantz*

DINOSAUR EXPLORERS lets you play games and puzzles, learn about prehistoric animals, and watch movies.

Dinosaur Explorers

GRADE: **B+**; PRICE: $25 street; N-TK (Entertainment Technology/Memorex Software); 310/403-0044; http://www.mrxsoftware.com

READER SERVICE NO. 782

TAXING TECHNOLOGY

IF YOU'RE A FEARLESS FILER who slogs through forms with equanimity, **SecureTax's** Online Tax Preparation/Online Filing Web site lets you fill out your tax forms and have the damage calculated free of charge on the Internet. Anything else is extra, though: You pay $4.95 to file a return electronically, $9.95 to print fileable documents on your own printer. SecureTax offers 88 federal and 45 state forms; a brief online interview guides you to the ones you need. The program calculates taxes automatically but offers minimal advice.

SecureTax doesn't guarantee accuracy, and it warns that the Net and the Web "are known to be unpredictable in their performance." I take that to mean you may crash early and often. Also, it some- ▶

True Colors for Less

THINK THAT BUYING an affordable color ink jet printer means settling for less? Not anymore. Although sub-$200 printers are infamous for their pokiness and mediocre print quality, Lexmark's new **2030 Color Jetprinter** is a pleasant surprise. It's the only printer in this price range that takes black and color cartridges simultaneously—no more swapping cartridges or pretending that the dark blue in your color output is really black. The 2030 can also print with a special waterproof black ink.

Although it wasn't fast enough to make it onto our Top 10 Printers chart this month, its combination of stylish design and a $199 price make the 2030 Color Jetprinter the perfect complement to a home PC. —Melissa Riofrio

2030 Color Jetprinter

GRADE: **A**; PRICE: $199 street; Lexmark Int'l, 800/358-5835; http://www.lexmark.com

READER SERVICE NO. 783

PHOTOGRAPH: ROBERT CARDIN

EDITED BY Christina Wood

times marks forms as complete when you've merely begun. However, veteran filers—especially those with simple returns and fast modems—shouldn't find creating a return here too taxing. —*Naomi Wise*

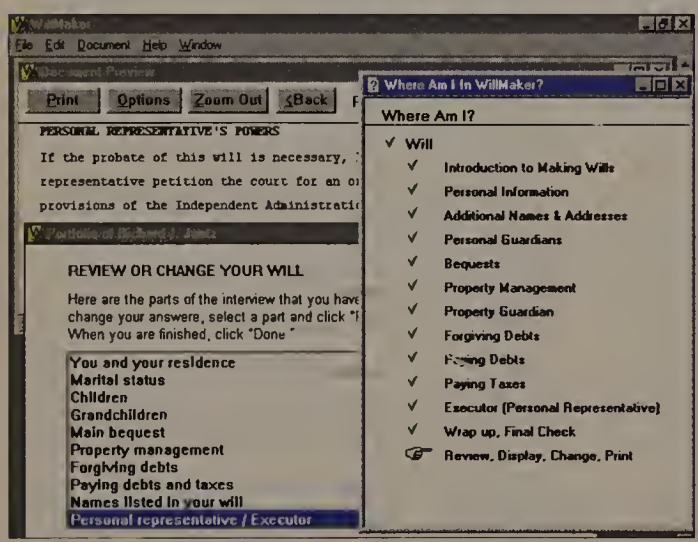
SecureTax

GRADE: **C**; PRICE: basic tax calculation free; Universal Tax Systems; http://www.securetax.com

READER SERVICE NO. 784

PREPARE FOR THE FUTURE

THEY'RE YOUR TWO least favorite topics: death and lawyers. But face it, you need a will. At least with Nolo Press's **WillMaker 6** you don't have to meet the lawyer (or the grim reaper) in person. The program helps you create a will by asking plain-English questions—no confusing legalese. After the interview, you can review and edit your answers before WillMaker generates the documents—will, living will, and final arrangements—tailored to property, circumstances, and state law. The fine documentation and online help answer many commonly asked questions. The program even tells you when to consult a real live lawyer. Once you and your witnesses sign them, WillMaker's documents have legal force (in all states except Louisiana). So cheer up, and focus on the legal fees WillMaker can save you. —*Richard Jantz*



WITH WILLMAKER'S SIMPLE INTERVIEW FORMAT, you can easily create your own will and related legal documents.

WillMaker 6

GRADE: **A**; PRICE: $29 street; Nolo Press; 800/992-6656; http://www.nolo.com

READER SERVICE NO. 785

LIGHTS, CAMERA, CLICK!

WHY WOULD YOU watch a movie on your computer when you have a TV and a VCR? Good question. Sirius Publishing has released some 50 motion pictures on CD-ROM, including Jim Carrey's blockbuster *The Mask*. Titles in the **Movie CD** series cost between $10 and $25 and come with virtual remote control and viewing software that delivers full-screen, full-motion video without requiring special hardware or software. Its video quality is better than you'd expect, but the Sirius product won't replace your television and VCR. Think of it as a cheap way to run your own in-flight movie on business trips or to keep the kids busy in the car. —*James Oliver Cury*

Movie CD

GRADE: **C**; PRICE: $10 to $25 list; Sirius Publishing; 602/951-3288; http://moviecd.com

READER SERVICE NO. 786

RENAISSANCE MAN

IF HE'D PUT HIS MIND to it, **Leonardo da Vinci** probably could have predicted that microprocessors would one day bring his work to life. This superb biographical CD-ROM would have proved him right. The original Renaissance man's paintings, maps, and architectural and engineering plans documented his world and in many ways predicted ours. This title analyzes the *Codex Leicester*, Leonardo's legendary treatise on water dynamics. Richly designed virtual tours and animations, narrated slide shows, and an elaborate time line render a sumptuous portrait of the man and his times. —*Derk Richardson*

Leonardo da Vinci

GRADE: **A**; PRICE: $49.95 list; Corbis; 800/609-6111; http://www.corbis.com

READER SERVICE NO. 787

F Y I

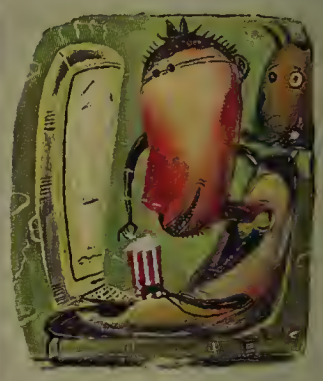
IF YOU THINK the Internet is crowded *now*, wait for the millennium. According to a recent study, half of all U.S. households—some 36 million homes—will be online by the year 2000.

SOURCE: JUPITER COMM. 1997 CONSUMER INTERNET REPORT

KEEPING UP

Help at the Video Store

STUMPED FOR A MOVIE to rent Friday night? Let the Reel Web site (http://www.reel.com) pick one for you. Tell it what movies (or actors, directors, or genres) you like, and Reel Web will suggest some films. One day it will even rent you the movie. It promises to be the best video store, on or off the Web, when it's fully operational. At press time, only parts of the site worked.



Home Is Where the Money Is

IF YOU'RE THINKING about buying (or refinancing) a house, you won't relish that trip to the bank to ask for a mortgage. So don't go. Find a lender (for any kind of loan) via the Web at http://www.lendersinteractive.com. Say who you are, where you want to buy, and how much you want, and the site generates a list of possible lenders. Then you call the lender directly to negotiate terms. If you aren't sure how big a mortgage you qualify for, check out the loan qualification calculator first at http://www.homefair.com.

A Crime Not to Pay

THE ONLINE WORLD is safer since the hacker known as Happy Hardcore was convicted in federal court last January on charges of felony computer fraud. It seems he distributed copies of some software he developed (AOL4-FREE) that lets you access America Online without paying. You can download AOL4FREE from PC World Online (just kidding).

Job Hunt

THE NET HAS MANY PLACES you can look for a job. A new site, http://www.headhunter.net, is free both to job hunters and to potential employers. Even small businesses can now let their modems do the hiring

—Christina Wood

ILLUSTRATIONS: LEFT, JAMES KRAUS; RIGHT, RICK SEALOCK

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PC WORLD

TOP 5 HOME PCs

	SYSTEMS	Street price (12/28/96)	Overall rating	PC WorldBench score	Reliability/ service rating	Setup rating	Comments	Reader service number
1	Dell Dimension P200v 800/388-8542 http://www.dell.com	$2499	88	213 outstanding	best/ best	fair	**FEATURES:** P-200, 32MB of SDRAM, 2.1GB hard drive, 8X CD-ROM drive, 33.6-kbps fax-modem, 15-inch monitor. **PRO/CON:** Basic bare-bones power machine gives near-record performance at a very reasonable price. Price here includes MS Office Pro but no other software; mail order only. Good foundation for home office.	733
2	Hewlett-Packard Pavilion 7285 800/724-6631 http://www.hp.com/info/pchome	$2848	84	207 outstanding	best/ good	outstanding	**FEATURES:** P-200, 32MB of RAM, 3.1GB hard drive, 8X CD-ROM drive, 28.8-kbps fax-modem, 15-inch monitor. **PRO/CON:** Lots of muscle makes this a good choice for the power or home-office user. Same family-oriented collection of software as the 7280P.	734
3	Micron Home MPC 800/223-6571 http://www.micron.com	$2720	83	215 outstanding	good/ best	good	**FEATURES:** P-200, 32MB of RAM, 1.2GB hard drive, 12X CD-ROM drive, 33.6-kbps fax-modem, 17-inch monitor. **PRO/CON:** The fastest home machine we've tested; software package includes Microsoft Office Pro, Quicken, Encarta, and MechWarrior 2. Expensive, but you get what you pay for. Small hard drive.	735
4	Gateway 2000 P5-166 Family PC 800/846-2000 http://www.gw2K.com	$2199	83	199 very good	fair/ best	good	**FEATURES:** P-166, 16MB of RAM, 2.5GB hard drive, 8X CD-ROM drive, 33.6-kbps modem, 17-inch monitor. **PRO/CON:** Very fast, good price, big hard drive and monitor. Available only through mail order. Gateway 2000's less-than-spectacular reputation for reliability makes this a system for the confident user.	736
5	Hewlett-Packard Pavilion 7280P 800/724-6631 http://www.hp.com/info/pchome	$2848	82	184 good	best/ good	outstanding	**FEATURES:** P-166, 16MB of RAM, 3.1GB hard drive, 8X CD-ROM drive, 33.6-kbps fax-modem, 17-inch monitor, built-in color scanner. **PRO/CON:** Great home machine with snapshot-size color scanner and image editing software. Family-oriented software collection includes Encarta, Quicken, The Great Word Adventure, and SimCity 2000.	737

Best Buy — All products: 910

HOW WE TEST The overall rating is based on reliability and service (30 percent), price (20 percent), PC WorldBench performance (20 percent), setup (10 percent), compatibility (10 percent), and extra features (10 percent). Reliability and service ratings are based on results of PC World's Reliability and Service Monitor survey.

WHAT IS IT WITH DELL? It's just about the only system vendor out there that *doesn't* sell a line of home PCs. You can't buy a Dell system with a sleek space-age design, a built-in photo scanner, or a collection of games. Yet a Dell system has won the Top 5 Home PCs Best Buy in 9 of the last 11 issues. Why?

Reliability and service, that's why. When you're home without an information services department, the last things you want are a dead machine and a long wait on hold. Dell is the regular winner in *PC World*'s monthly Reliability and Service survey, giving our readers the fewest system problems and the fastest tech support. (See "PC Reliability and Service: Good-Bye to Good Support?" December 1996.) The fact that Dell sells very fast computers at a very reasonable price doesn't hurt.

Once again, the Dell Dimension P200v places first in the race for the Top 5. The $2499 P200v also comes with a Pentium-200 processor, 32MB of RAM, a 2.1GB hard drive, and the second-fastest performance we've seen in the Top 5.

The four runners-up are also repeats from last month. Our second-place winner, HP's $2848 Pavilion 7285, also sports a P-200 processor and 32MB of RAM, along with a family-oriented software collection. In the third spot is Micron's Home MPC, the fastest home PC we've tested, but expensive at $2720. The fourth-place Gateway 2000 P5-166 Family PC offers undistinguished performance but a low $2199 price tag. Finally, HP's Pavilion 7280P comes with a built-in photograph-size color scanner, a 17-inch monitor, and the same software bundle as the 7285. With all these extras, it's no wonder you're paying the same price for a slower machine.

NEC's $3198 Ready Office 1625 is the most interesting new system we tested, thanks mainly to the included Iomega Zip drive and APS uninterruptible power supply. The Zip drive allows you to store files on removable 100MB cartridges. The UPS protects your data and hardware from power outages and power surges. Unfortunately, a high price and poor service and reliability scores kept NEC's Ready Office far from the Top 5.

—*Kirk Steers*

NEC'S READY OFFICE has a Zip drive and a UPS but didn't make the Top 5.

Kirk Steers is a contributing editor for PC World. *Testing performed by Ulrike Diehlmann of the PC World Test Center.* ■

ILLUSTRATION: JEFFREY PELO

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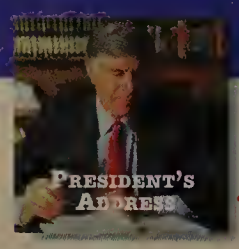

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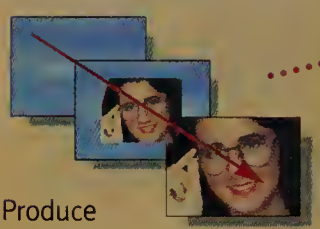

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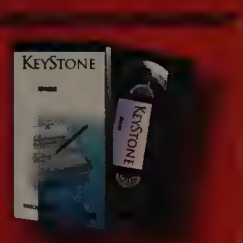

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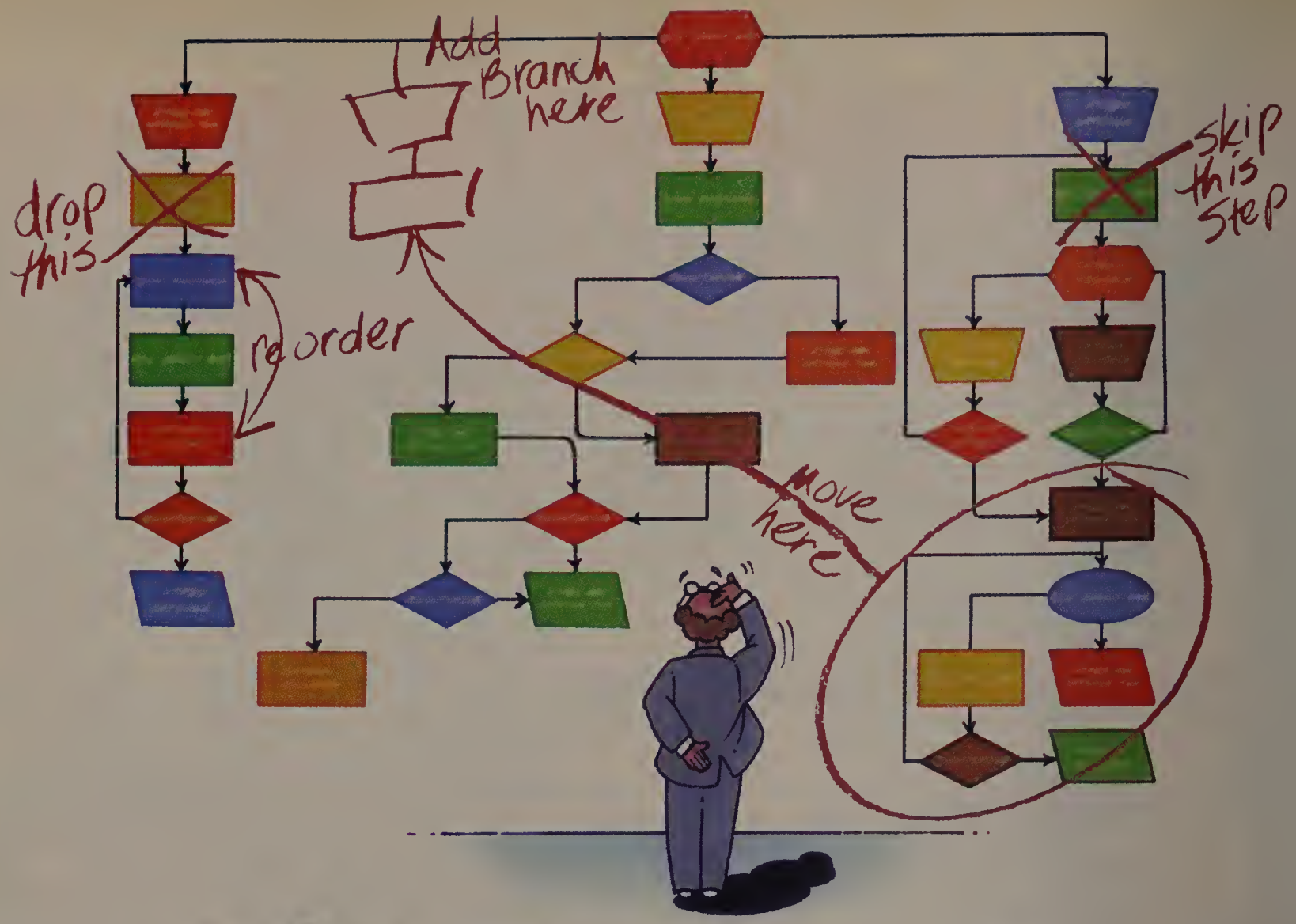

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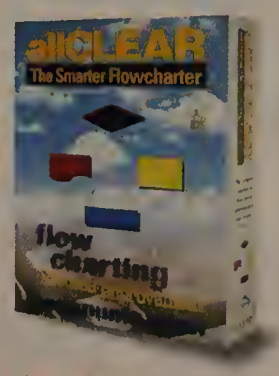

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Dive In and Upgrade

MY WIFE'S GENERALLY a patient person. In addition to putting up with me, she gets saddled with the computer hand-me-downs. But the bits hit the fan recently when she tried to modify a bunch of humongous image files on her ancient 486. It was time for an upgrade.

Actually, the timing couldn't have been better. Prices are rock-bottom: Less than $70 for 16MB SIMMs, $250 for a 2GB hard drive, 8X CD-ROM drives for under $100. Check them out yourself at Price Watch, a terrific Web site for bargain hunters (http://www.pricewatch.com).

Maybe it's a Zen thing (or a nerd thing), but I get a kick out of upgrading computers. It's not difficult. If you can read directions and know how to hold a screwdriver, you too can add RAM or give yourself a better hard drive without insurmountable anxiety. All you need is a handful of tools, a good how-to book, and dauntless curiosity. And when you slip the case back on and everything's working—it's immensely satisfying.

As a veteran upgrader, I've got some advice to share. First, give yourself plenty of time, more than you think you'll need. (One day researchers will prove that computer hours are twice as long as regular hours.) I like weekends because they have fewer interruptions; the downside is that tech support may not be available. So it's a good idea to keep a copy of James Karney's comprehensive guide, *Upgrade and Maintain Your PC* (MIS Press, 1996, 800/488-5233), within arm's reach. It's filled with valuable nitpicky details that I don't often see in other books. It's a must-have for every upgrader.

PROCEED WITH CAUTION

BEFORE YOU STICK your head under the hood, you *must* take some basic precautions. The obvious but most important one comes first: Unplug the computer. If you inadvertently add or remove a card with the power on, you could kiss your motherboard—and perhaps something even closer to you—good-bye.

It's also essential that you protect your computer's insides from your own static electricity. If you don't, you risk frying the system board, memory SIMMs, or other components. You can buy a cheap anti-static wristband at most electronic supply houses for under $5. Or do what I do—touch the power supply every so often.

Timing couldn't be better for **upgrading** your system. Prices are **rock-bottom.**

Arm yourself with small Phillips and flathead screwdrivers (make sure they're not magnetized) and a pair of needle-nose pliers. A small flashlight's handy because tiny screws inevitably will drop into the case and hide under the floppy drive. I use a specialized tool for retrieval—a wooden chopstick with a bead of Silly Putty at the end. And listen, it's absolutely critical that you recover all lost screws: A stray sitting on your motherboard can easily cause a short. I use one of those plastic boxes with all the pigeonholes to hold and keep track of the multitude of screws and system board brackets.

THE DAY OF RECKONING

BEFORE I REPLACE a component, I put labels on *everything*. I use a marking pen and masking tape to label cables, so I can see where and how they plug in. If a cable has more than one connector (say, for the hard drive and the CD-ROM drive), the cable gets another note saying which connector is for what drive. I do this even for the cables I'm not planning to unplug, because things can come off accidentally. I also record the upgrade history—the brand, model, size, and interrupt request (IRQ) number—on a tag right inside the case, where it's unlikely that even *I* could lose it.

One more thing: Don't force anything. When installed correctly, connectors always fit smoothly and easily. If one doesn't, you're doing something wrong.

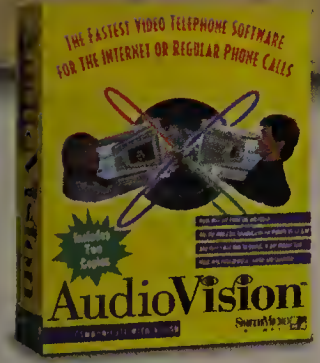
If you're going to be adding a lot of internal components or rearranging what's already there, spend a minute sketching out a diagram of where everything's plugged in and where each add-in card is located, in case you accidentally dislodge another cable. A warning, though: Fiddling with more than one peripheral at a time increases the risk of something going kaflooey and makes it nearly impossible to figure out what's wrong. My recommendation? Install one device, make sure it's working right, and then tackle the next one.

After you've tested everything, closed the computer, and tested everything again, sit back and admire your work. Nothing makes a personal computer seem more—well, personal—than knowing it inside and out.

Contributing Editor Steve Bass is a licensed marriage and family therapist and president of the Pasadena IBM Users Group. He can be reached on PC World Online. *See page 14 for contact information.* ■

ILLUSTRATION: RICK SEALOCK

See what you've been missing on the Internet.



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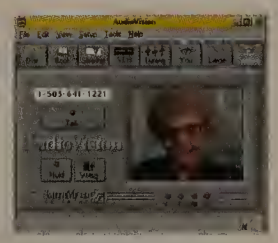
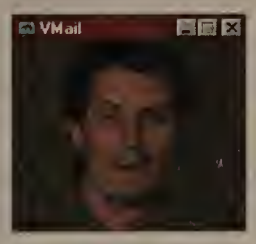
AudioVision supports virtually all major digital cameras and most capture boards and it's a breeze to install and use. So stop missing the picture, pick up AudioVision or download a free demo version at www.smithmicro.com

call the plant in asia over the Internet and discuss scheduling using the whiteboard



call grandma and show her how the kids have grown

call home from a business trip using your laptop



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HERE'S HOW

ANSWER LINE

Change Your Office Identity

I ENJOYED THE TIP "Changing Your Identity in Windows 95" in the September 1996 Answer Line. Following your lead, I was able to use the Registry Editor to change my company name in Windows 95 and in all my other applications listed in the Registry. However, I was not able to change my company name in any of the Microsoft Office 95 programs. Can it be done?

Elmer Wise, Baltimore

YES, BUT YOU'LL NEED TO uninstall Microsoft Office completely, then reinstall it—which is probably not worth your effort. Surprisingly, even editing Office's Registry settings doesn't change the company name displayed in the splash screens and Help•About dialog boxes.

SPEED UP YOUR SPORTSTER

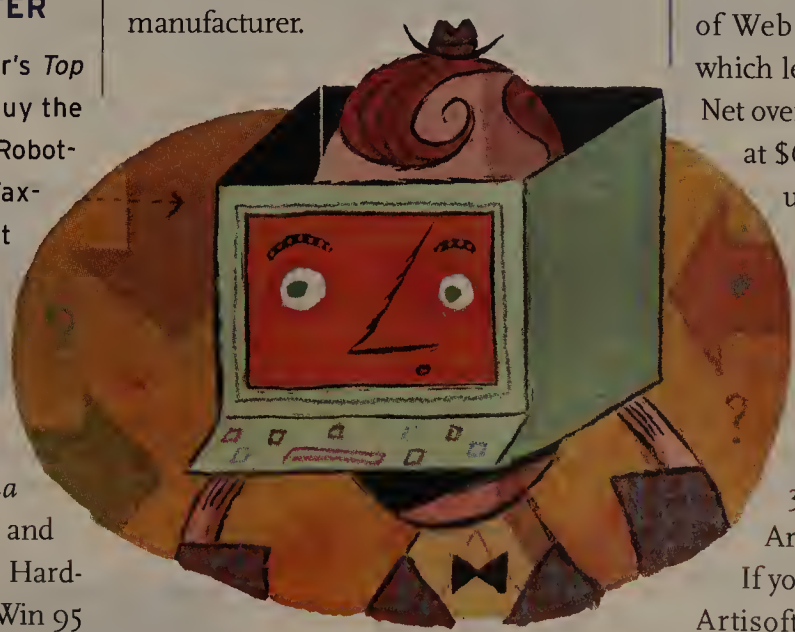
AFTER READING December's *Top 10 Modems*, I decided to buy the number one Best Buy U.S. Robotics Sportster Voice 28.8/33.6 Faxmodem. However, the Top 10 chart says this particular model is not listed in the Windows 95 driver collection. Is that a problem? And can you tell me how to install the driver?

Dwayne Avery, Coats, North Carolina

WHEN YOU INSTALL the modem and try to detect it using the Add New Hardware Wizard in the Control Panel, Win 95 will identify it, nearly correctly, as a 28.8-kilobits-per-second Sportster

To install it as a 33.6-kbps Sportster, download the latest mdmusrsp.inf file from the U.S. Robotics Web site (http://www.usr.com/home/software/dl07.htm—the second character in *dl07.htm* is a small *L*, not the numeral 1). Then copy it to your Windows/Inf directory. In some browsers, you may need to right-click the link and the option to save the file.

Next, redetect the modem by selecting *Start•Settings•Control Panel* and double-clicking the *Add New Hardware* icon. Note that this procedure should also work with other hardware, especially with modems and network adapters, provided that they are installed using only .inf files, preferably the most up-to-date version from the manufacturer.



MI MODEM ES TU MODEM

OFFICES—even home offices—are increasingly becoming networked affairs. You may wonder if all your networked computers can share one system's modem. In addition to saving the cost of multiple modems and phone lines, modem sharing reduces the clutter of telephone wires and modem power supplies in your den...er, office.

Both Windows 95 and Windows for Workgroups let you share the fax portion of your fax-modem with other users on the LAN; Windows NT support is on the way. Unfortunately, Windows doesn't let you share a modem's data communications capability—you'll need one of several add-on solutions to do this.

If all you need is Internet access, and you use either the PPP or SLIP dial-up protocol to connect to your service provider, Adrian de Croy's WinGate is more than adequate. It's also free if only one network user accesses the shared modem at a time. You can download the Windows 95– and NT–compatible program from distributor Deerfield Communications' Web site. The latest version, 2.0, adds more-sophisticated user security and http file caching, which can speed up reading of Web pages. Multiple-user licenses, which let additional users connect to the Net over a single dial-up connection, start at $60 for two and top out at $320 for unlimited concurrent users.

Artisoft sells a similar program—the $249 i.Share 2.0—that lets Windows 3.1 and Windows 95 users connect to the Internet using the modem on another Windows 95 machine. A 30-day demo is available from the Artisoft Web site.

If you need more than Internet access, Artisoft's ModemShare enables you to share one or more modems just as you would share hard drives or printers. The modem works as if it were installed on the local machine, allowing you to dial in to online services, bulletin board systems, remote e-mail servers, and Internet providers, as well as enabling you to send faxes. (Only one person can use the modem at a time.) The program supports

By Scott Spanbauer

ILLUSTRATION: ADAM McCAULEY

Windows 95 and 3.1 and DOS, and shares up to 32 modems on different machines with the entire local network. You can download a free 30-day demo version from Artisoft's Web site. A single-modem version costs $129.

If Windows NT figures prominently in your network, you may want to consider purchasing Spartacom USA's SAPS for Windows NT. Like ModemShare, the Spartacom program allows you to share modems with users of DOS, Windows 3.1, Windows for Workgroups, and Windows 95, but it also supports Windows NT. However, at $594 for a five-user license, SAPS for Windows NT may sap your budget. A five-user Windows 95–only version costs $299. You can download 28-day working demo versions of the server and client software.

• WinGate version 2.0, two users $60, unlimited users $320; Deerfield Communications; 517/732-8856; http://www.deerfield.com/wingate/

READER SERVICE NO. 692

• i.Share 2.0, $249; ModemShare, 1 modem $129, 32 modems $2229; Artisoft; 800/846-9726; http://www.artisoft.com/

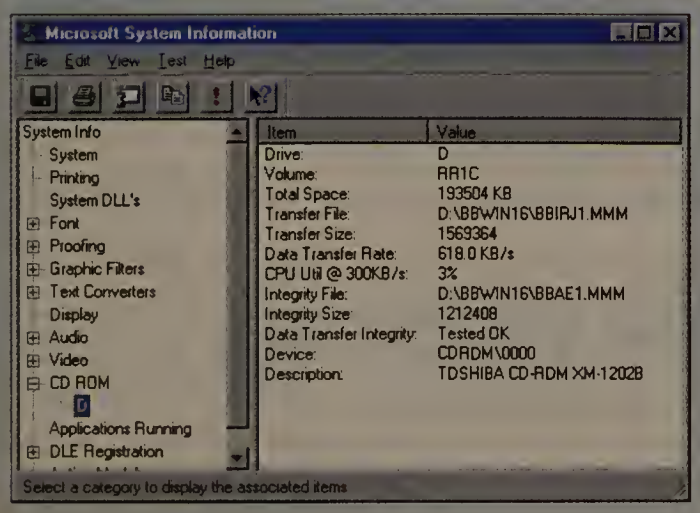
READER SERVICE NO. 693

• SAPS for Windows NT, five users $594; Windows 95-only version, five users $299; Spartacom USA; 770/622-2820; http://www.tspco.com/sapshmpg.htm

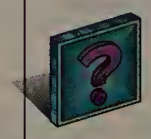
READER SERVICE NO. 694

Keep Tabs on Your PC With Microsoft System Information

MANY NEW Microsoft applications come with a Microsoft System Information utility that can show you quick overviews of critical information about your PC. To run the utility, choose *Help•About•System Info* in any of those applications. Some Microsoft products, including Office 97, even come with multimedia-enabled versions of the utility that let you view and test installed audio and video drivers, and test the data transfer rate of your CD-ROM drive.



DETECT BUGGY PARTITIONS



I READ WITH INTEREST your articles about the problems with Windows 95's fdisk ["Trouble With Windows 95's Disk Partitioning," *Bug Watch*, August 1996; "fdisk Follow-Up," *Bugs and Fixes*, October 1996]. How can I tell if my hard disk has one of the problematic type 0E or 0F partitions? And how do I switch it to a safe partition type?

Steve Eason, Paducah, Kentucky

WHEN YOU CREATE a FAT partition with the fdisk utility that comes with MS-DOS, Windows 95, and Windows NT, it generally makes a type 06 (primary) or type 05 (extended) partition. For details, see the table on the next page.

Windows 95 added two new types—0E and 0F. These correspond to types 06 and 05, respectively, but take advantage of newer IDE hard disk controllers' ability to read drives faster.

Unfortunately, Windows 95 is the only operating system that can read type 0E and 0F partitions, meaning that if you boot with an MS-DOS floppy or Windows NT start-up disk, or dual-boot to your previous MS-DOS version or Windows NT, some or all of your hard disk partitions may be unreadable.

In addition, Windows 95 has a bug that renders 0E and 0F partitions unreadable when you shut down and restart in MS-DOS Mode. This Mode bug can result in data corruption. Fortunately, Microsoft has a patch. For a brief description of both the problem and the patch, you can point your Web browser to http://www.microsoft.com/windows/common/aa2719.htm, and then click on *Disk Type Specific Driver Update for Windows 95*. You should note, however, that the patch does not change the partition type.

To check what partition types are in use on your system, download PowerQuest's free partinfo utility. Visit Powerquest's home page (http://www.powerquest.com); click on the *Tech Info & Support* link and then on *Download PARTINFO.EXE*. In addition, you can find the program at ftp://powerquest.com/pub/partinfo.exe, as well as on PC World Online at http://www.pcworld.com/software_lib/.

To identify your partition type, just run the partinfo.exe program and look for the heading FS. ▶

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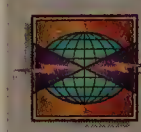

DON'T MISS ADDITIONAL HERE'S HOW information on **http://www.pcworld.com/hereshow.**

If you need to change partition types, use PartitionMagic version 2.03 or later. It lets you convert type 0E and 0F partitions to the more compatible 06 and 05 types.

Alternatively, you can delete the partitions and then re-create them using an MS-DOS version of fdisk. You can also use Windows 95's fdisk and prevent it from creating the troublesome partition types by launching it with the command **fdisk /x**. Deleting partitions and logical drives destroys any data they contain, so back up your hard drive first.

Find files from this article at http://www.pcworld.com/software_lib/ and more tips at http://www.pcworld.com/hereshow. Answer Line *welcomes your questions and pays $50 for published items. Contributing Editor Scott Spanbauer is author of* The No B.S. Guide to Windows 95 *(No Starch Press, 1996, 800/420-7240). See page 14 for contact information.* ■

Types of Disk Partitions

Partition type ID	Partition type	Supported sizes	File system	Compatible operating system(s)
01	primary	up to 16MB	FAT12	DOS 2.0 and later, Win 95 and NT
04	primary	16MB to 32MB	FAT16	DOS 3.0 and later, Win 95 and NT
05	extended	up to 2GB	n/a [1]	DOS 3.3 and later, Win 95 and NT
06	primary	32MB to 2GB	FAT16	DOS 4.0 and later, Win 95 and NT
07	primary	up to 2TB [2]	NTFS	Windows NT
0B	primary	up to 2TB [2]	FAT32	Windows 95 (OSR2 only)
0C	extended	up to 2TB [2]	n/a [1]	Windows 95 (OSR2 only)
0E	primary	32MB to 2GB	FAT16	Windows 95
0F	extended	up to 2GB	n/a [1]	Windows 95

[1] n/a = not applicable. Extended partitions do not have file systems; logical drives do. [2] TB = terabyte. 1TB = 1024GB.

KNOW YOUR PARTITION TYPES, especially if you boot multiple operating systems or if you have purchased a new computer that has Windows 95 preinstalled. Not all operating systems can read every partition type. Also, Windows 95 has a bug that makes 0E and 0F partitions unreadable when you shut down your system and restart in MS-DOS mode.

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Class of '95 average cost: about $26,000

Class of '10 projected cost: about $60,000

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Dress Up Your DOS

"IT'S UGLY BUT it gets you there." That line from the old Volkswagen ads applies to DOS as well: It's still the fastest way to make wild-card file name changes, automate your system with batch files, and handle other file management tasks. You also can customize the look of a DOS prompt running in Windows. Here's how:

Frame it. To make your DOS prompt run in a window instead of full screen, start the PIF Editor in Win 3.*x*. For Program Filename, type **command.com**. Then select *Windowed* under Display Usage. Choose *File•Save* and save the file as **command.pif**. In Windows 95, locate and right-click the *MS-DOS Prompt* icon in the Programs folder and choose *Properties*. Click the *Screen* tab and select *Window* under Usage. Check *Restore settings on startup* to preserve this setting. Then click *OK*.

Name it. If you're running your DOS prompt in a window, you can customize its title bar name. In Windows 3.*x* you can just change the icon name in Program Manager. Select the icon, press **<Alt>-<Enter>** to see its properties, edit the Description, and click *OK*. In Windows 95, open the DOS window's Properties sheet as described above. Click the *Program* tab and type your custom window title in the box at the top.

Kill the commercial. Each DOS session begins by announcing its maker at the top of the window or screen. To skip this commercial in Windows 3.*x*, start the PIF Editor and open the PIF you created above (or follow the directions there to make one). For Optional Parameters, type **/k cls**. The /k switch executes a command (in this case the cls, or clear screen, command) and then allows the DOS session to continue running. Save the file. To do this in Windows 95, open the DOS window's Properties sheet as previously described. Click the *Program* tab and edit the end of the Cmd line information so that it reads **command.com /k cls**. Then click *OK*.

Give yourself more room. You can make your DOS prompt display more than 25 lines. In Windows 3.*x*, choose *File•Run* in either Program Manager or File Manager. Type **system.ini** and click *OK*. Under the [NonWindowsApp] heading, look for a line that begins 'ScreenLines='. (If you don't see it, add this on a line by itself.) Change the number to the right of the equal sign to a higher number (up to 50). Then save the file and restart Windows. In Windows 95, open the DOS prompt's Properties sheet as previously explained and click the *Screen* tab. For Initial Size, select the number of lines you want. Make sure *Restore settings on startup* is checked. This setting applies to all DOS programs running in a window, but some applications may override it.

Skip the instructions. By default, Win 3.*x* always tells you how to exit and switch to and from a DOS window. To remove this notice, open system.ini in a text editor. Look under the [386Enh] heading for a line that begins 'DOSPromptExitInstruc=' and edit it to read **DOSPromptExitInstruc=0** (add the line if necessary).

Own the prompt. To have a custom command prompt in either Win 3.*x* or 95, add a line like this to your autoexec.bat file: **set winpmt=Type "exit" to return to Windows pg**. Edit the text to the right of the equal sign as you like; pg shows the current directory and the greater than (>) symbol. If you want things colorful and don't mind using ANSI codes, load ansi.sys in your config.sys file by adding the line **device=c:\windows\command\ansi.sys**, adjusting the path as needed. Then enter the necessary codes in your 'set winpmt=' line. Or just adapt this: **set winpmt=$e[41;1;33m Windows is still running! Type EXIT to end this DOS session. $e[0m$_%PROMPT%$e[40;0m**. See **FIGURE 1** for the result. When you're finished, save the autoexec.bat file and restart your PC.

If you've got it, font it. You can customize the font used when your DOS prompt is running in a window (except if you have an old screen driver that doesn't allow this). In Windows 3.*x*, choose *Fonts* from the Control menu—the one you get when you click the little Control box that's in the upper left corner of every window. Select a setting from the font list. To make this font your default, check *Save Settings on Exit* and click *OK*. In Windows 95, open the DOS prompt's Properties sheet from the Control menu. Click the *Font* tab and select your font types and sizes. The Auto ▶

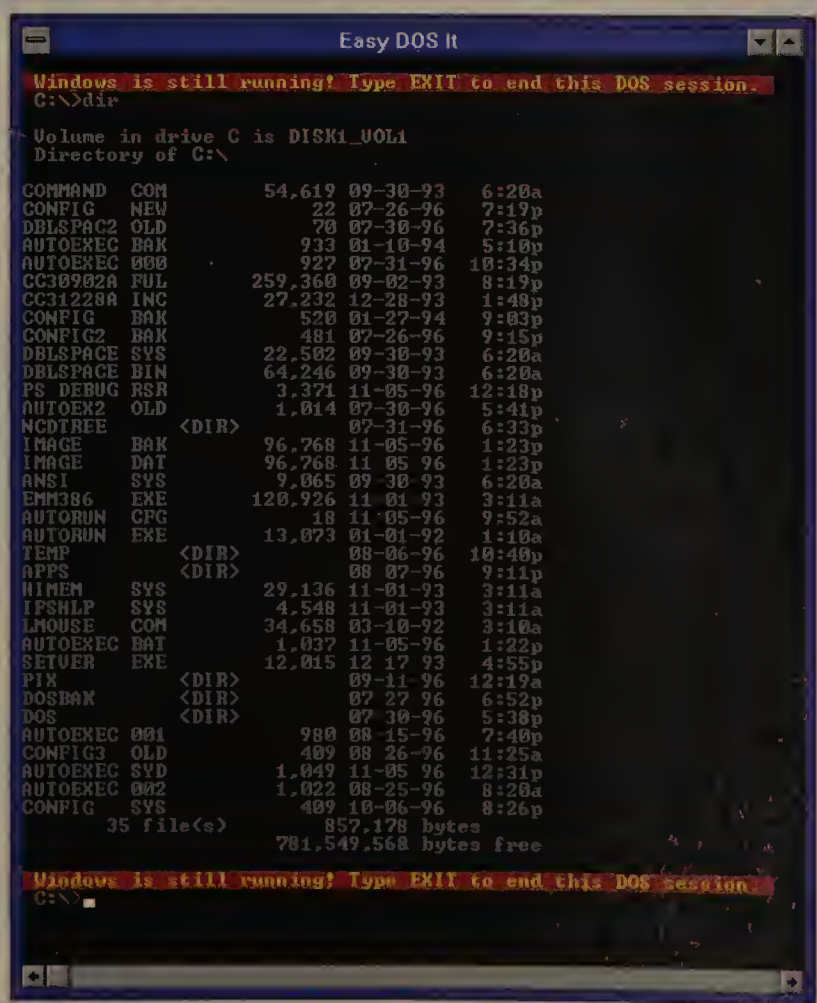

FIGURE 1: GIVE DOS A MAKEOVER with a custom title, added lines, and other enhancements—and remove clutter like exit instructions.

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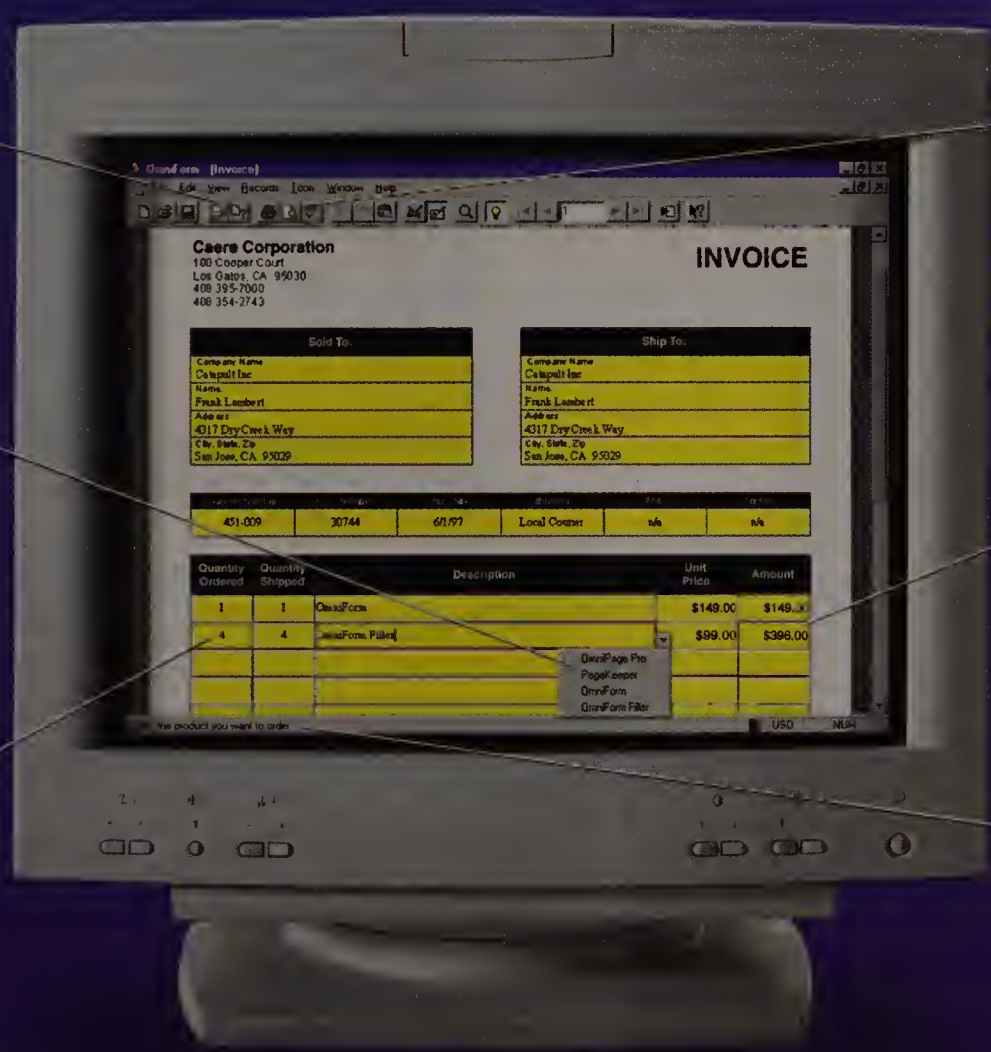

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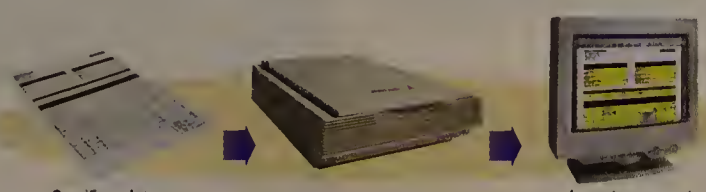

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setting automatically adjusts the font's size as you resize your DOS prompt window. As before, you'll need to check *Restore settings on startup* in the Screen tab to keep this setting for future sessions.

UNMASKING ORPHANED SYSTEM FILES

THINK YOU MIGHT have, oh, just a few outdated files lingering on your system?

When you're trying to drop this extra baggage, the most confusing files to deal with are system files that some applications install in your Windows or Windows\System folder. They blend into the crowd of other impossible-to-identify files and hog up hard disk space forever.

The only foolproof way to catch all these orphaned files is if your software comes with documentation or an uninstaller feature to remove them.

Even commercial uninstalling software isn't entirely foolproof unless you used it to keep a record of the program when you first installed it. The other solution is to create batch files that log all installation changes for you (see "Tracking the Infiltrators," *Windows Q&A*, July 1995).

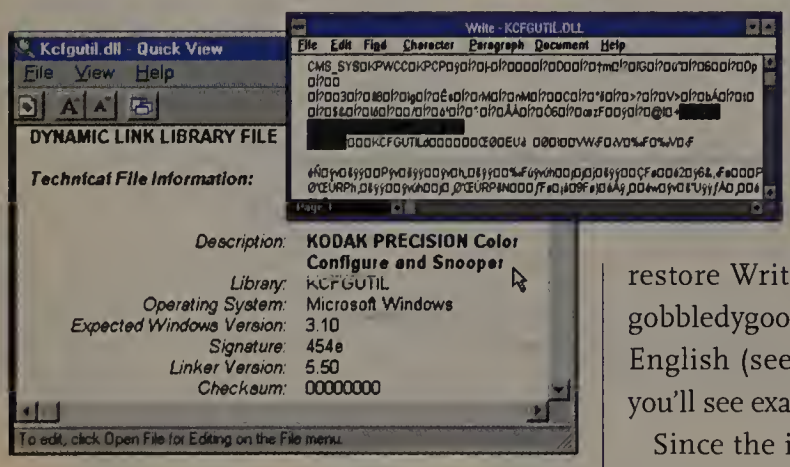

FIGURE 2: UNMASK PERPLEXING system files using Quick View in Windows 95 or Windows Write in Windows 3.x.

But if you lack these resources, what do you do? Divining the parentage of system files is largely guesswork, but here are a couple of tips to make it a little easier.

In Windows 95, you'll need the Quick View utility provided with that operating system. If you didn't install it before, choose *Start•Settings•Control Panel* and double-click the *Add/Remove Programs* icon. Click the *Windows Setup* tab, select *Accessories*, and click *Details*. Check the *Quick View* option and click *OK*. Click *OK* again in the Add/Remove Programs dialog box and insert the necessary disk when you are prompted.

Now, whenever you are trying to learn where a system file came from, right-click the file name in Explorer and choose *Quick View*. If you're lucky, the summary or view of the contents will give you some important clues, such as the manufacturer's name.

Although Windows 3.*x* doesn't come with a file viewer, you can open just about any file with the Windows Write word processor. Start Write and minimize it on your desktop. Then drag a system file from File Manager and drop it on the Write icon. Click *No Conversion*. Then restore Write and skim through all the gobbledygook until you find some plain English (see **FIGURE 2**). If luck prevails, you'll see exactly what you need.

Since the information you're likely to find won't always be crystal clear, don't delete these (possibly) orphaned files just yet. Instead, move them to a temporary directory for a few days or weeks until you're sure everything on your system runs well without them. You can then delete the files or, to be extra cautious, archive them to a floppy disk.

CLEAN UP THE ADD/REMOVE PROGRAMS LIST

IN YOUR HASTE to remove an unwanted Windows 95 program, it's easy to forget that many of these applications come with their own uninstallers.

These utilities can be launched from the *Add/Remove Programs Properties* sheet: Just choose *Start•Settings•Control Panel*, double-click the *Add/Remove Programs* icon, select the program from the list, click *Add/Remove*, and follow the on-screen prompts.

If you bypass this method and remove the software manually, you may be stuck with the vanquished application name still in the Add/Remove list (see **FIGURE 3**).

Fortunately, you can delete useless items from this list by editing the Registry. But since mistakes made while modifying the Registry can really put Windows 95 on the fritz, you should start by making backup copies of the user.dat, user.dao, ▶

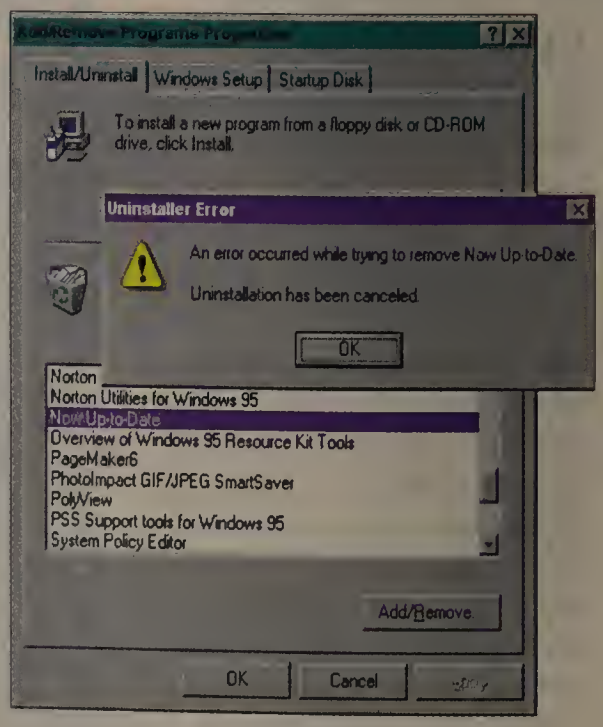

FIGURE 3: REMOVING AN APPLICATION can leave an orphaned entry in the Add/Remove Programs Properties sheet.

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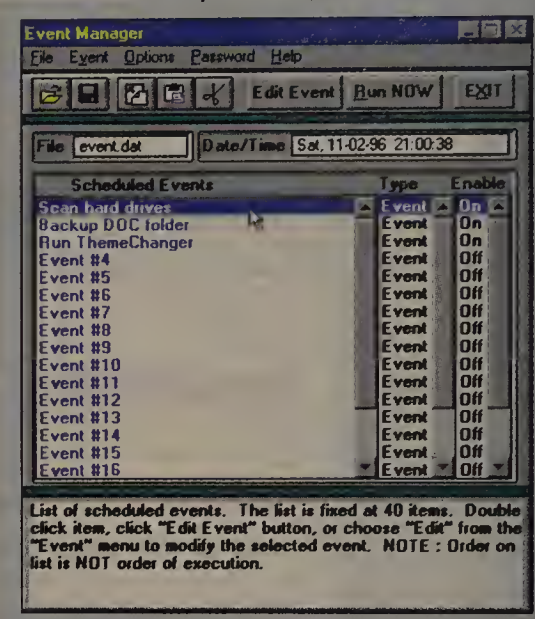

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P704

system.dat, and system.dao files. Then choose *Start•Run*, type **regedit**, and press **<Enter>**. Navigate down the tree to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall.

The folders in the Uninstall folder contain the uninstall information for each application that uses this feature. Most folders are clearly labeled with the application name; if not, selecting the folder to view its contents in the right-hand pane will usually give you more information. Find the folder for the application you've deleted and remove it.

Alternatively, you can try the TweakUI applet that's discussed in the March *Answer Line*. Download this free Power Toy utility from Microsoft's Web site (http://www.microsoft.com/windows/software/powertoy.htm).

TRACKING YOUR HOUSEKEEPING HABITS

YOU'VE HEARD IT before, and you know you need to hear it again: From time to time you must check your hard disks, defragment any errors that are found, and back up your data. But if you don't have a scheduler program or a regular routine for doing these chores, you may forget when you did them last.

Shouldn't *something* keep track of this important stuff?

Fortunately, Windows 95 does. To find out when any of these chores were last performed, double-click *My Computer*, right-click a hard drive, choose *Properties*, and then select *Tools*. You'll see a complete status report on error-checking, backing up, and defragmenting for that drive (see **FIGURE 4**). And now that you know how long it's been, maybe it's time to get down to those chores again.

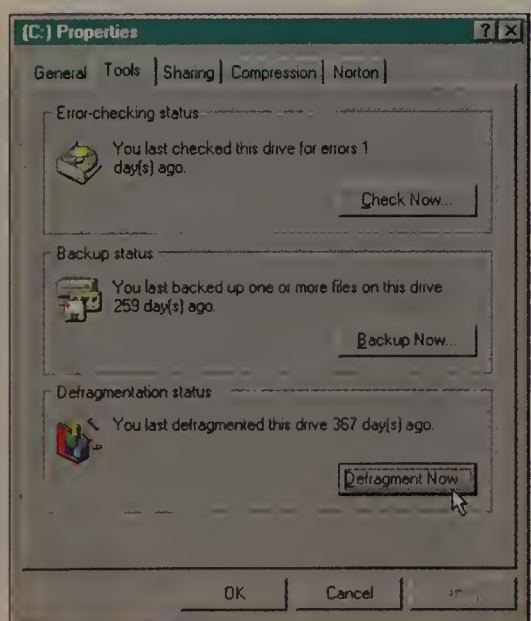

FIGURE 4: WONDERING WHEN you last did your hard disk housekeeping chores? Windows 95 keeps track for you.

INSTANT PATHS IN WINDOWS NT 4.0

LONG FILE AND FOLDER names can make typing more tedious than ever if you are still using a command prompt. Fortunately, Windows NT 4.0 will do most of the typing chores for you. You just have to turn this feature on, which requires a little editing of the Registry.

Fooling around with the Registry can cause big problems, so make sure you've already created an NT emergency repair disk; it can fix Registry problems if you goof up. If you don't have the repair disk, choose *File•Run* in Program Manager or File Manager, type **rdisk**, and press **<Enter>**. Use this utility to create a repair disk before proceeding.

Now choose *Start•Run*, type **regedit**, and press **<Enter>** to get into the Registry. Climb down the tree to HKEY_CURRENT_USER\Software\Microsoft.

In the Microsoft folder, look for a folder called Command Processor. (If you don't see it, right-click *Microsoft* in the tree pane and choose *New•Key*. Next, type **Command Processor** and press **<Enter>**.)

Select the *Command Processor* folder in the tree pane. In the right pane, look for an icon labeled CompletionChar. If you don't see it, right-click in the right pane and choose *New•DWORD Value*. Then type **CompletionChar** and press **<Enter>**.

Double-click the *CompletionChar* icon. Type **9** in the Value data box and press **<Enter>** or click *OK*. Next, in the same pane, look for an icon labeled EnableExtensions. (If you don't see it, right-click in the right pane and select *New•DWORD Value*. Type **EnableExtensions** and press **<Enter>**.) Double-click the *EnableExtensions* icon. Type **1** in the Value data box and press **<Enter>** or click *OK*. Then exit the Registry Editor.

The rest is easy. The next time you're in a command prompt window, just type your command plus the first letter or two of a file or folder you need. Then press **<Tab>** to have NT type out the first file or folder that begins with those letters. If you don't get what you want, just keep pressing **<Tab>** until you see the file or folder name you're looking for. For example, if you're at the root of your C: drive, you'd type **dir pr** and then press **<Tab>** to see a directory listing of the Program Files folder (or any other folder that begins with *pr*).

Happy typing!

Find files from this article at http://www.pcworld.com/software_lib and additional tips at http://www.pcworld.com/hereshow. Windows Tips *welcomes your tips and questions and pays $50 for published items. Contributing Editor Scott Dunn is a principal author of the* PC Bible, 2nd Edition *(Peachpit Press, 1995, 800/283-9444).* *See page 14 for contact information.* ■

Put the Move on Applications

WHEN YOU MOVE an application file in Windows 95, it creates a Shortcut by default. But I almost always want to move the file. How can I make Windows do this, without having to drag the file using the right mouse button?

Alexandre Biron, Trois-Rivieres, Quebec

BECAUSE APPLICATION (.exe) files often won't run if they're moved from their installed folder, Microsoft made it harder for novices to mess things up: Windows creates a Shortcut when a file is dragged, rather than actually moving the file itself.

There is one exception: When you left-drag any file (not just .exe files) to a different disk Windows 95 copies the file rather than moving it or making a Shortcut.

While you can't change Windows 95's default behavior, there are some keyboard tricks you can use to override it.

To move a file (regardless of the destination or file type), hold down **<Shift>** as you drag with the left mouse button. And to copy any file to any destination, hold down **<Ctrl>** as you drag with the left mouse button.

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HEWLETT PACKARD

Working With Pivot Tables

READERS OFTEN ASK ME how to build macros or complex formulas to rearrange and summarize worksheet data. In many cases, the best solution is to rethink the worksheet architecture instead.

Jim Ellington of Wilmington, North Carolina, uses Excel to track his team's contract sales. Jim sets up his workbook with a separate sheet for each salesperson. The figure below shows a simplified version of one sheet from his workbook.

Jim's summary sheet contains formulas that gather the totals from each salesperson's page. The arrangement works, but

	A	B	C	D
1	Client	Start	End	Amount
2	ABC Corp	12/7/96	2/5/97	$ 57,980
3	DEF Co.	12/4/96	2/22/97	$ 91,084
4	GHI, Inc.	12/3/96	3/2/97	$ 97,603
5	JKL, Ltd.	11/20/96	1/11/97	$ 73,348
6	TOTAL			$320,015
7				

Summary | Harris | Smith | Jones

Jim has problems creating a list of contracts summarized by client, and to add a salesperson he must rebuild formulas.

A better approach would be to use a database-and-pivot table design. In this arrangement, the data for all salespeople are stored on a single sheet. A pivot table on a separate sheet displays the current contract data for each salesperson, individually or together, and a subtotal outline generates summaries. Storing all the data on one sheet allows you to rearrange and summarize in many ways, without having to move data or create complex formulas.

Step by Step, below, shows how to set up the example workbook.

In step 2, creating the dynamic range name is a standard trick to ensure that the pivot table remains synchronized with any new data you enter into the database.

To create the pivot table in step 3, select any cell in the database, and select *Data•PivotTable*. In the second step of the Pivot Table Wizard, select *Database* as the pivot table range. In step 3 of the wizard, drag the *Sales Person* field into the Page area, drag *Client* into the Row area, and drag the remaining fields into the Data area. Next, double-click *Count of Start*, enter **Start Date** in the Name box, select *Max* in the Summarize By list, click *Number*, choose a Date format, and click *OK* until you're in the wizard. Repeat for End and for Amount. For Amount, enter **Contract Amount** in the Name box, choose *Currency* as the number format, and click *Finish*.

When the pivot table appears, drag the *Data* button to the right to align the variables, as in step 4. To select a salesperson, click the drop-down list by cell B1. If you add contracts or a new salesperson to the database sheet, select *Data•Refresh Data* to include them in the pivot table. Finally, deselect *Grand Totals for Columns* in the resulting dialog box, and click *Finish*.

To create the subtotals report in step 5, return to the database worksheet, select a cell in the database, and select *Data•Subtotals*. In the At Each Change box, select *Client;* click *OK* to create the subtotals, then click the second-level button on the outline to show the Client subtotals.

Find more tips at http://www.pcworld.com/hereshow. Spreadsheets *welcomes questions and pays $50 for published items. Contributing Editor Richard Scoville is a software training consultant in Chapel Hill, North Carolina.* *See page 14 for contact information.* ■

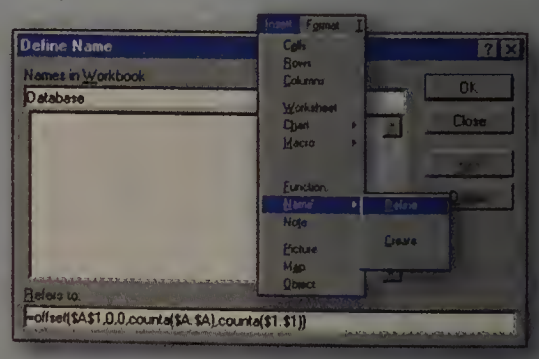
STEP BY STEP

Use an Excel Pivot Table to Rearrange and Summarize Data on a Single Sheet

	A	B	C	D	E
1	Sales Person	Client	Start	End	Amount
2	Harris	ABC Corp	12/7/96	2/5/97	$ 57,980
3	Harris	DEF Co	12/4/96	2/22/97	$ 91,084
4	Harris	GHI, Inc.	12/3/96	3/2/97	$ 97,603
5	Harris	JKL, Ltd	11/20/96	1/11/97	$ 73,348
6	Jones	MNO Group	12/18/96	2/14/97	$ 65,687
7	Jones	PQR Assoc	11/15/96	1/21/97	$ 74,098
8	Jones	STU, PA	11/26/96	1/15/97	$ 79,918
9	Jones	VWX, Inc	11/16/96	1/5/97	$ 88,064
10	Jones	YZA, Corp	12/21/96	2/23/97	$ 90,345
11	Smith	BCD Inc.	12/10/96	3/9/97	$ 89,096
12	Smith	EFG, MD	11/30/96	1/18/97	$ 76,222
13	Smith	ABC Corp	12/14/96	1/25/97	$ 87,041
14	Smith	HIJ, Inc	11/21/96	1/3/97	$ 99,391
15					

1 Create the database by entering the data and column heads shown here.

2 Create a dynamic range name for the database: From the main menu select *Insert•Name•Define*. In the Names in Workbook box, enter Database. In the Refers to box, enter the formula =offset(A1,0,0, counta($A:$A),counta($1:$1))



	A	B	C	D
1	Sales Person	Smith		
2				
3		Data		
4	Client	Start Date	End Date	Contract Amount
5	ABC Corp	12/14/96	1/25/97	$87,041
6	BCD Inc.	12/10/96	3/9/97	$89,096
7	EFG, MD	11/30/96	1/18/97	$76,222
8	HIJ, Inc.	11/21/96	1/3/97	$99,391
9	Grand Total	12/14/96	3/9/97	$99,391
10				

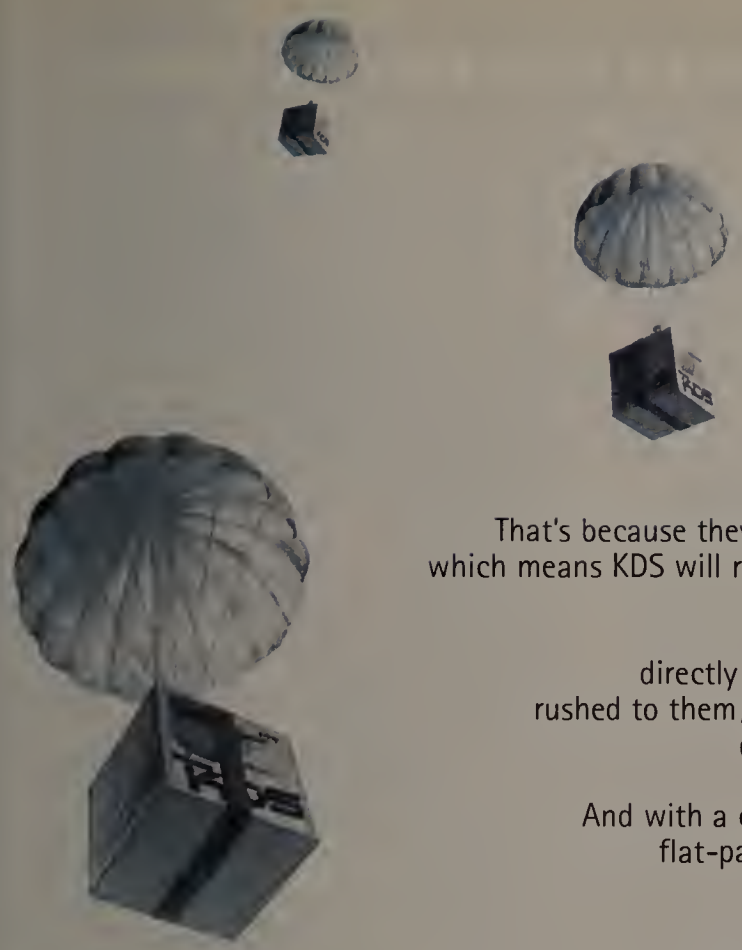
3 Create a pivot table: From the main menu select *Data•PivotTable*. In the second step of the Pivot Table Wizard, select *Database* as the pivot table range. In step three of the wizard, drag the Sales Person field into the Page area, drag the Client field into the Row area, and drag the remaining fields into the Data area.

4 Drag the *Data* button to the right to arrange the columns as shown. Deselect Grand Totals for Columns in the resulting dialog box, and click *Finish*.

	A	B	C	D	E
1	Sales Person	Client	Start	End	Amount
5		ABC Corp Total			$ 235,966
7		BCD Inc. Total			$ 89,096
10		DEF Co. Total			$ 156,771
13		EFG, MD Total			$ 156,140
15		GHI, Inc. Total			$ 97,603
17		HIJ, Inc. Total			$ 99,391
19		JKL, Ltd. Total			$ 73,348
21		PQR Assoc. Total			$ 74,098
23		VWX, Inc. Total			$ 88,064
24		Grand Total			$1,070,477

5 Create a subtotals report by selecting a cell in the database and selecting *Data•Subtotals* in the main menu. In the At Each Change box, select *Client*, and then click the *OK* button.

6 Click the *Outlines* buttons to collapse the outline levels.



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Browse Word objects ◆ Delete unneeded menu items ◆ Make docs international

Browsing All Objects in Word 97 Documents

NOWADAYS, DOCUMENTS can be filled with objects as well as plain text, and Word 97 adds a quick new way to explore such objects in your documents. You can browse them using only your mouse and the scroll bar. You jump from object to object without having to scroll through all the intervening text. Objects that can be browsed include graphics, tables, headings, sections, fields, and even footnotes and endnotes.

FIGURE 1: REVIEW GRAPHICS, TABLES, and other objects in your document without having to scroll through the intervening text.

Browsing objects is the fastest way to review individual elements of your document—and it's a handy way to proofread for errors that you might otherwise have skimmed over.

Just follow these two steps to use this handy new tool.

1. Click the *Select Browse Object* button on the scroll bar, and select the object type that you want to browse in the resulting dialog box (as shown in **FIGURE 1**, above).

2. To browse through the objects, click either the up or down double-arrow icons shown here. Word will jump up or down in the document, displaying each object of the selected type in turn.

CLEANING UP WORD'S MENUS

IF THERE ARE a lot of Word's menu commands that you never use, get rid of them. This is easy to do for many menu items in Word 6 and 7. Just follow these three steps to erase them.

1. Press **<Alt>-<Ctrl>-<Hyphen>**. Your mouse pointer will change to a large minus sign.

2. With the new mouse pointer, click a main menu item, then click the menu command you want to remove. The pointer will change back to normal. Note: Some menu entries are critical to Word's operation and can't be removed.

3. Repeat steps 1 and 2 for each menu item you want to remove. Word will save the changes in your normal.dot template when you exit the program.

If you accidentally delete a menu item, select *Tools•Customize*, click the *Menus* tab, then click the *Reset All* button and answer *Yes* when you are asked to confirm the reset. Word will restore all normal menu commands.

INTERNATIONAL CHARACTERS IN WORD

PERHAPS NOTHING looks worse to an international customer than seeing their name or address misspelled in correspondence because someone ignored accented characters. Sadly, many people neglect these characters because they're just too darned difficult to type.

A little-known feature in Word makes it easy to type accented characters without having to resort to the Insert Character dialog box or arcane ANSI codes. The table below details the keystroke shortcuts for inserting almost any international character into your document. These keystrokes are quite easy to remember, once you've used them a time or two, and they work in Word versions 6, 7, and 97.

CREATING NAMED RANGES IN WORDPERFECT TABLES

IT'S MUCH EASIER to create formulas in WordPerfect tables if you name the table ranges, as you would in a spreadsheet program. This lets you create formulas such as Sum(Prices), rather than typing the actual cell addresses—for example, +Sum(A1:A10)—into the formula. Furthermore, as your table changes and you insert rows or columns, your named ranges automatically adjust to the new table dimensions.

To give a group of cells a name, follow these six easy steps:

1. Drag the mouse over the cells to highlight them.

2. Select *Table•Names*. ▶

Add International Characters to Your Documents With These Keystroke Shortcuts

To insert	Press	Then type
á é í ó ú ý	<Ctrl>-'	a e i o u y
Á É Í Ó Ú Ý	<Ctrl>-'	A E I O U Y
à è ì ò ù	<Ctrl>-`	a e i o u
À È Ì Ò Ù	<Ctrl>-`	A E I O U
ä ë ï ö ü ÿ	<Ctrl>-<Shift>-:	a e i o u y
Ä Ë Ï Ö Ü Ÿ	<Ctrl>-<Shift>-:	A E I O U Y
â ê î ô û	<Ctrl>-^	a e i o u
Â Ê Î Ô Û	<Ctrl>-<Shift>-^	A E I O U
å Å	<Ctrl>-<Shift>-@	a A
æ Æ	<Ctrl>-<Shift>-&	a A
œ Œ	<Ctrl>-<Shift>-&	o O
ß	<Ctrl>-<Shift>-&	s
ð Ð	<Ctrl>-'	d D
ø Ø	<Ctrl>-/	o O
ç Ç	<Ctrl>-,	c C
ã Ã ñ Ñ õ Õ	<Ctrl>-<Shift>-~	a A n N o O
¿	<Alt>-<Ctrl>-<Shift>-?	
¡	<Alt>-<Ctrl>-<Shift>-!	

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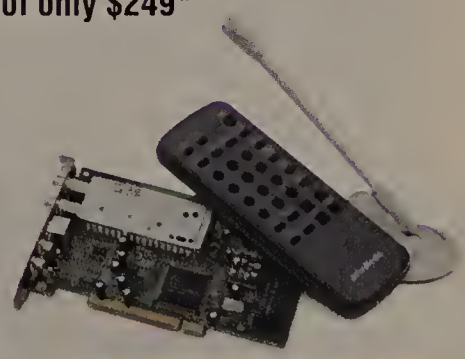

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** SRP. Desktop camera/camcorder, sound card and modem required for video phone application.*

3. In the Table Names dialog box, select *Create*.

4. In the Create Name dialog box, type the desired range name in the 'Enter name manually' text box, then click *OK*.

5. Click *Close* to return to your table.

6. Repeat as necessary to create additional named ranges.

BETTER WEB PAGES IN WORDPERFECT 7

WORDPERFECT 7 does a good job of converting its documents into HTML format, preparing them for the World Wide Web. But you have to follow some basic rules to get the best results.

Rather than formatting each line individually, apply heading styles instead. WordPerfect looks at the style selected for the text rather than at the applied formatting, which can vary.

Place your cursor in the line you want to format, then click the *Styles* drop-down list on the toolbar or select *Format•Styles*, and choose a preset heading style—*Heading 1*, *Heading 2*, and so on (see **FIGURE 2**).

If you format your document with these styles, WordPerfect converts them into the appropriate heading styles for Web pages when you save the file in HTML format.

If the preset heading styles don't suit you, modify them by selecting *Format•Styles*. Choose the style you want to modify, then select *Edit*. In the Styles Editor dialog box, modify the style to suit your normal format. This can also dramatically speed up creation of your documents by cutting down on formatting time.

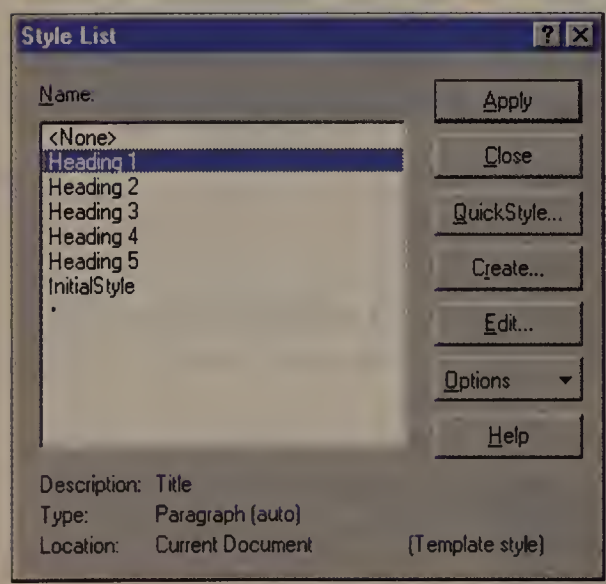

FIGURE 2: SAVE WORDPERFECT FORMATTING to your Web page by applying styles from this list.

UPDATES TO WORDPERFECT OFFICE 7

USERS OF THE ORIGINAL VERSION OF the WordPerfect 7 Suite will want to take advantage of a couple of offers from Corel. The first is CorelCare CD, which offers some bug fixes for the Suite programs, along with an extensive and searchable technical support database. It's free from Corel, and I recommend that every WordPerfect user install it. The technical support database will help you solve knotty problems; the bug fixes take care of glitches in the original release.

The second update product is the NT Update for WPWin7 Suite. It costs just $9.95 for registered users, and solves problems some have encountered when running the software under Windows NT. It includes additional code changes that work both in Windows 95 and Windows NT, but it doesn't have the technical support database that's on the CorelCare CD.

You can get your copies of these updates by calling Corel. You'll need the serial number for your copy of the program, which you get by selecting *Help•About*.

• CorelCare CD free; NT Update for WPWin7 Suite; $9.95; Corel; 800/772-6735

READER SERVICE NO. 788

ADD DROP CAPS IN WORD PRO 97

IN AMI PRO AND WORD PRO 96, producing a large, dropped capital letter at the beginning of a paragraph was a chore: You had to create a new frame, position it, and format a single letter to look the way you wanted.

That tedious task is finally gone in Word Pro 97. To create a drop cap letter in that version, follow these steps:

1. Place the cursor in the paragraph you want to begin with a dropped capital, then select *Edit•Drop Cap*.

2. In the Drop Cap dialog box, select a style for your initial capital letter from among the Place Drop Cap options. As you click each option, you'll see a preview of how the text will look.

3. In the Height of Drop Cap field, select the number of lines you want the drop cap to take up. The default of 3 is a good start.

4. Click *OK*, and Word Pro 97 will automatically create the frame, insert the first letter of the paragraph, and resize that letter to match your selections.

To delete the drop cap, just select its frame, press **<Del>**, and retype the letter.

QUICK NUMBERED LISTS IN WORD PRO 96

WHEN YOU WANT to include numbered lists in your Word Pro documents, you could right-click on the text, click the *Bullets and Numbers* tab (circled below) in the Text Properties dialog box, and then choose a Number Style—*1.*, *A.*, *a.*, *I.*, or *i.*

But there's a much simpler method. With your cursor on the line where you want the numbering to start, click the *Style* button on the status bar at the bottom of your document window. When the style list pops up, choose *Number List*, and start typing your list (**FIGURE 3**). The items will be numbered as 1., 2., 3., and so on.

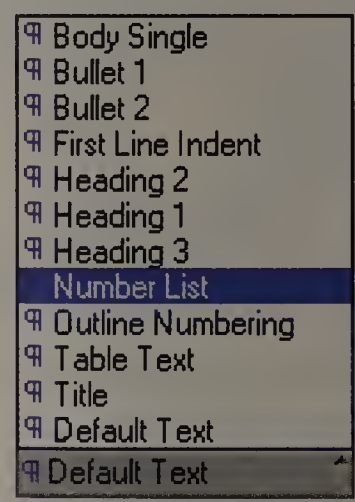

FIGURE 3: TO CREATE a numbered or bulleted list in Word Pro, click the Style button on the status bar.

If you want to change the number style after you enter the list, you'll have to use the Text Properties dialog box and select the *Bullets and Numbers* tab. When you're finished with the list, just switch back to the style you were using previously. You can do the same thing for bulleted lists, choosing one of the preset styles.

Find additional tips at http://www.pcworld.com/hereshow. Word Processing *welcomes your tips and questions and pays $50 for published items. George Campbell is a* PC World *contributing editor and was a collaborator on* The PC Bible *(Peachpit Press, 1995, 800/283-9444).* *See page 14 for contact information.* ■

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Improve Your Outlook

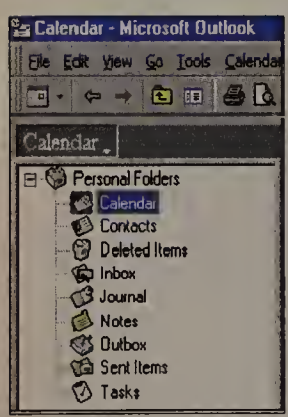
MICROSOFT OUTLOOK IS to personal information management as Microsoft itself is to application software—it wants to do *everything* for you.

More specifically, Outlook provides an in-box for your e-mail, a way to organize contacts in business-card form, a calendar, and a to-do list.

All these components are tightly integrated with one another, and with many other parts of the Microsoft Office 97 desktop suite. (Outlook is also available separately.) Here are a few tips for putting Outlook to use.

HIDE THE OUTLOOK BAR

THE OUTLOOK BAR is the box that appears on the left side of the screen when you start the program. It provides shortcuts to Outlook's folders. It's very handy, but you may prefer to allocate more of the screen to the stuff you actually work on. If that's the case, hide the Outlook bar by selecting *View* and deselecting *Outlook Bar* in the drop-down menu.



But, you say, how can I then switch to one of the other folders? Easy. Click on the folder name just below the toolbar to display a folder list (see the figure above), then click on the desired folder.

MAKE A DATE

IN OUTLOOK'S CALENDAR folder, you can look at one date at a time and see the hours of the day listed down the left side of the screen. Or you can view a couple or three days at a time. The days appear side by side but with the hours still listed on the left. You can also view an entire week or an entire month.

To view a whole month, click a weekday letter (S M T W T F S) above one of the small calendars at the upper right of the screen. To see a whole week, click to the left of the week in the small calendar at the upper right (see **FIGURE 1**).

To view just one day, double-click one of the day headers on the left side of the screen. To see a few consecutive days side by side, drag the mouse over the days in the calendar. And to see nonconsecutive days, click the first day you want to see on the calendar, then hold the **<Ctrl>** key and click the second day. Continue holding the **<Ctrl>** key and click the other days.

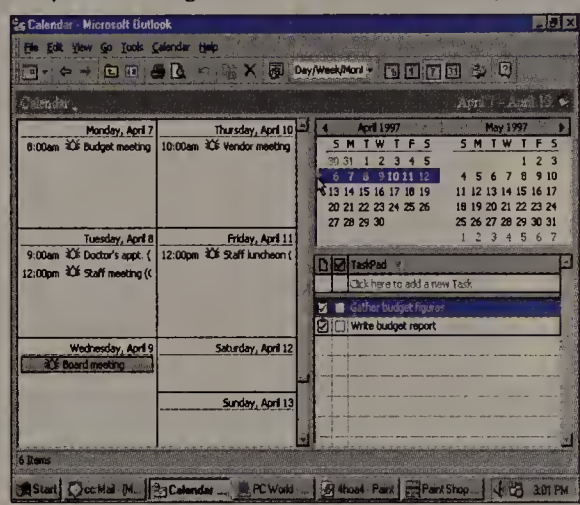


FIGURE 1: VIEW YOUR SCHEDULE in the Calendar folder a month at a time, a week at a time (shown here), or by selected days.

REMEMBER YOUR FRIENDS

NOT ALL THE NAMES in your Contacts folder are for people who handed you their business cards at conventions. Sometimes they're your valued colleagues, or perhaps you include friends and relatives so that you can find their phone numbers.

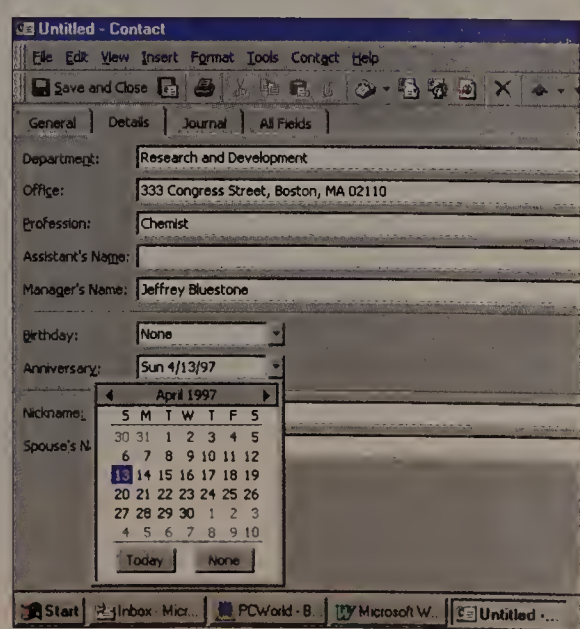


FIGURE 2: OUTLOOK'S CONTACTS folder can remind you of someone's anniversary.

If you want Outlook to remind you of a colleague's or friend's birthday or anniversary, just double-click the person's name in the Address Cards view, click the *Details* tab, and enter the date in the Birthday or Anniversary field; or select it from a monthly calendar in the drop-down list (see **FIGURE 2**). Outlook displays the selected date in the Calendar.

SORT IT ALL OUT, PART I

OUTLOOK'S INBOX AND TASKS folders let you sort by clicking on column headings, just as would you do in Windows 95's Explorer. But check out these two slick enhancements.

First, when you click on a column heading, an arrow shows you that the listing is sorted by that column and in which direction. If the arrow points up, the list is sorted in ascending order; if it points down, the list is in descending order.

Second, you can base your sort on more than one column. To accomplish this, click the first column that you want to sort the list on. Click a second time if you want to reverse the sort order. Then hold down the **<Shift>** key and click the column that you want to use to break any ties that occur in the first sorted column. To reverse the order of the second sort column, continue to hold down the **<Shift>** key and click the second column again.

SORT IT ALL OUT, PART II

IF YOU DON'T like the order in which the columns appear in a Tasks or Inbox folder, you can easily move the columns around: Just position the mouse pointer over the column heading, then drag it to the right or left until red arrows show where the column heading will be dropped when you release the button.

Find additional tips at http://www.pcworld.com/hereshow. Richard Cranford is a freelance writer and programming consultant in Cambridge, Massachusetts. See page 14 for contact information. ■

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Model	CRT size/ Viewable	Dot Pitch	Max Resolution	Optimal Res/ Refresh	Plug & Play +
V773	17"/15.8"	.026mm	1280x1024	1024x768/85Hz	Yes
V775	17"/16.0"	.026mm	1600x1280	1280x1024/79Hz	Yes

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September 1996

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Break chain letters ◆ Browse the Web privately ◆ Access bookmark servers

Practice Netiquette by Deleting Chain Letters

CHAIN OF FOOLS

COMMON SENSE tells you that you shouldn't forward an e-mail message that begins "This amazing story is true! Pass it on!" But common sense doesn't always prevail on the Internet, where chain letters flourish like guppies in a pet store.

If you feel compelled to forward one of these public nuisances—or any mass-mailed e-mail for that matter—first delete from the message's header that long list of e-mail addresses that names the other zillion people who have already read (and deleted) the letter. That's Internet good manners. Also, if you're going to post it in a mailing list, ask the list's owner first.

Here are a few of the most insidious e-mail chain letters. If they end up in your box, press the **<Delete>** key, please.

The African native good luck letter. The message is decorated with big ASCII caricatures. If you forward it to 20 people, you will supposedly get good luck. The message does not say whether you will get good luck if you receive it 20 times a week. Nor does it explain how the letter, which supposedly originated from Zaire and has been passed around the Net for at least five years, escaped before Internet access was common in the Congo.

The $250 cookie recipe. The mystery writers of this letter purport that they called Mrs. Field's Cookies and asked for a copy of Mrs. Field's cookie recipe. They were told by a company representative that it would cost them "two-fifty." They said "What a deal!" but their next credit card statement showed that they had been charged $250. In retaliation they are revealing the cookie recipe. Mrs. Field's Cookies denies the story, which has been floating around the Net and BBSes for at least a decade. A different version points the blame at Neiman-Marcus and is similarly false. The recipe in one of the chain letters is identical to the Old Fashioned Chocolate Chip Oatmeal Cookie recipe on the back of Nestle's Toll House chocolate chips bag (which I tested and found to be not that great).

The kid in Georgia. Some sick Georgia kid is supposedly collecting get-well cards in the hope of getting in the *Guinness Book of World Records*. But the address to mail the cards to is bogus. Never forward any charity plea unless you are affiliated with the charity or have checked it out.

The Good Times virus. This virus allegedly hides in e-mail messages. It's questionable whether anyone has actually seen the Good Times virus, but everyone has seen the message about it. In general, you should not forward virus warnings unless you get them from a reputable source. Some mailing lists are routinely swamped with bogus virus warnings, much to their administrators' chagrin.

Please, Do Not Forward

1. Charity pleas, unless you are affiliated with the charity or have checked it out.
2. Virus warnings, unless you get them from a reputable source.
3. Messages detailing illegal (and ineffective) pyramid schemes in which you send, for example, $10 to 20 people, they all send $10 to 20 more, and so on.
4. Cute poems.
5. Chain letters.
6. Any messages to a mailing list without asking the list's owner first.

KEEP YOUR WEB BROWSING PRIVATE

AS YOU VISIT WEB SITES, your browser writes the URLs into myriad far-flung files on your hard disk—cache files, cookie files, history files, and the Windows Registry. This may be of no concern to you if you're the only one using your machine, but if you share your PC and you fritter away far too many hours on extremely foolish Web pages, you might want to familiarize yourself with the places that your browser ▶

COVER YOUR WEB BROWSING TRACKS

Where you leave your trail	What is stored	Cover your tracks in Netscape Navigator, Windows 95	Cover your tracks in Netscape Navigator, Windows 3.x	Cover your tracks in Internet Explorer
Cache folder	Images and URLs of pages you visit to speed viewing later	Delete the Cache folder from Program Files/Netscape/Navigator.	Delete the contents of the Cache folder in the Netscape folder.	Delete the Temporary Internet Files folder from the Windows folder.
Cookie file	Data you enter—an ID number, for example	Delete cookies.txt from Program Files/Netscape/Navigator.	Delete the cookies.txt file.	Delete the Cookies folder from the Windows folder.
History file	URLs of every Web site you've visited	Delete netscape.hst from Program Files/Netscape/Navigator.	Edit the netscape.ini file in the Netscape directory.	Delete the contents of the Windows/History folder.
Windows Registry	System and program settings	Select *Start•Run* and type regedit. Use the Registry Editor's *Edit•Find* command to find the URL History folder. Select and delete the URLs (but not the Default listing).	not applicable	Same as for Netscape Navigator, Windows 95.

ILLUSTRATION: ROBIN BRISKIN

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Designed for Microsoft® Windows® CE

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Microsoft Pocket Word
Microsoft Pocket Excel
2-4MB RAM
PCMCIA Card Slot
RISC Microprocessor
Instant Synchronization

FORM AND FUNCTION. The NEC MobilePro HPC was designed with one word in mind. Useability. It may be small and weigh less than a pound, but it's not short on practicality. Take a look at the keyboard. Its full complement of keys and tactile features are reminiscent of a full-size keyboard. And its bright LCD touch screen is highly responsive to the pen stylus, so you can browse efficiently through applications.

Just as importantly, you can work swiftly, thanks to the NEC V_R 4101 processor, which not only boosts speed and power, but gives you extended battery life.

So is the new NEC MobilePro HPC a pocket organizer or a PC? Well, it may be the size of a pocket organizer. But that's where the similarity ends.

For more information, or the retailer nearest you, call 1-888-306-4636.

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Circle 180 on reader service card

stores the URLs that you gaily type into it.

The cache folder. Every browser stores a Web site's images and URL in a temporary folder on your hard disk to speed viewing of the site during your next visit. While it's always a good idea to delete the contents of this folder once a week to prevent hidden file allocation units from eating up empty space on your disk, you may want to delete the files in the cache folder more often—say, after each Internet session—so others who use your machine won't know where you've been on the Web. Navigator's Cache folder is inside the Navigator folder. Internet Explorer's Cache folder is inside the Windows Temporary Internet Files folder.

Cookie files. *Cookies* are scripts embedded within a Web page that write unique codes to your hard drive's cookies.txt file. As you browse a site, this cookie file records each click.

Cookies are harmless in themselves, but their existence can compromise your privacy. The file in which your browser records cookies also contains URLs of sites that sent you the code. While one Web site can't directly use cookies that another site sent you, it can request the file without your knowledge and record the sites you've visited. Luckily, you can safely delete the cookie file after each Web session. To find Navigator's cookies, use Windows' *Find* feature to search for the file 'cookies.txt'. Internet Explorer keeps its cookies in a folder called Cookies inside the Windows folder. You can delete this folder after you exit Explorer.

History files. Every Web browser has one or more history files. They record every URL you've visited. If you're running Netscape Navigator for Windows 95, delete the netscape.hst file in the main Netscape directory whenever you close down your browser. In Navigator for Windows 3.1, you'll need to edit the netscape.ini file in the Netscape directory. You can use WordPad to do it. Look for the section titled 'URL History', then delete all the URLs that are listed. If you're running Microsoft Internet Explorer, look in the Windows\History folder, then drag all the URLs to the Recycle Bin.

The Registry. Windows 95's labyrinthine folder system stores system and program settings. The easiest way to ferret out its hidden URLs is to head to the Registry Editor: Select *Start•Run* and type **regedit**. In the Registry Editor window, select *Edit•Find* and then enter **URL History**. Select and delete the URLs, but not the Default listing. Navigator users should also select and delete the URLs they find in *HKEY_LOCAL_MACHINE/Software/Netscape/Netscape Navigator*, opening the version number folder if applicable. Internet Explorer users will find additional URLs in *HKEY_USERS/Software/Microsoft/Internet Explorer/TypedURLs*.

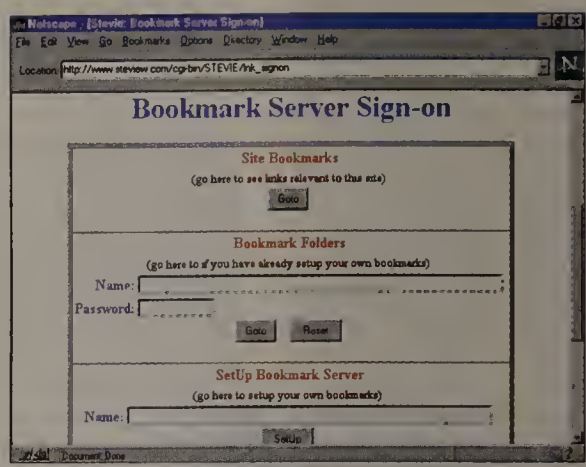
Web Sites for Girls Who Read

IF YOU OR SOMEONE in your life has a passion for *Anne of Green Gables, Little House on the Prairie, Nancy Drew,* or the hundreds of other girls' series books that are part of our literary heritage, tap into the Girls' series web page (http://members.aol.com/biblioholc/gseries.html). You'll find background and trivia on your favorite series, plus links to other girls' book sites. There are scads of Web sites devoted to girls' reading. Find more by heading to the Children's Literature Web Guide (http://www.ucalgary.ca/~dkbrown/index.html) and the Scholastic Place (http://scholastic.com/index.htm).

ANOTHER WAY TO KEEP WEB VISITS PRIVATE

FREDERICK J. WEILAND writes that to access your work-related bookmarks from home, and vice versa, you can store them at a site called a *bookmark server*.

A bookmark server, which is free, catalogs your bookmarks, giving you password-protected access from anywhere. Weiland recommends Stevie's, at http://www.steview.com/cgi–bin/STEVIE/lnk_signon (see the figure above). You can store your bookmarks in folders. The server sends you a message each week telling you which bookmarks are invalid.



STORE YOUR BOOKMARKS OFF-SITE so others can't see your list of favorite pages.

QUICK ACCESS TO NAVIGATOR BOOKMARKS

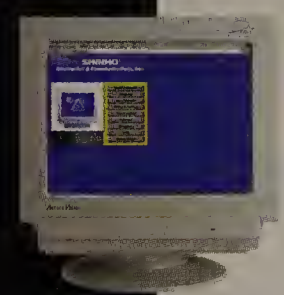
IN RESPONSE to November's tip for an easier-to-read bookmark directory for Navigator ("Fit All Your Bookmarks in One Window"), several readers submitted tips of their own. Edmund Woo of San Francisco suggested linking Navigator's bookmark file to the browser's Home button, then setting the browser to load the home page each time it is fired up. From the Navigator menu, select *Options•General Preferences* and click *Appearance*. In the Start With field, click *Home Page Location*. In the Start With edit box, type the path to your bookmark file. For instance:

file:///c:/progra~1/netscape/naviga~1/bookmark.htm.

Click *OK*. When you click *Home*, Navigator will display your bookmark list.

Find additional tips at http://www.pcworld.com/hereshow. Internet Tips *pays $50 for published tips and questions. Contributing Editor Judy Heim is the author of* The Needlecrafter's Computer Companion: Hundreds of Easy Ways to Use Your Computer for Sewing, Quilting, Cross-Stitch, Knitting, and More! *(No Starch Press, 1995, 800/420-7240). See page 14 for contact information.* ■

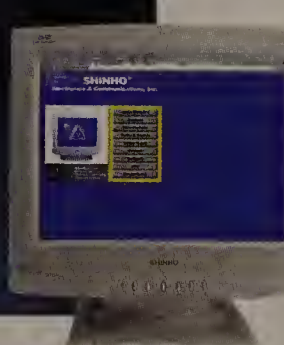
KNOW THE DIFFERENCE.



Aurora Vision 14"
14"/13.2 viewable
0.28mm dot pitch

AV2 585F
15"/13.75 viewable
0.28mm dot pitch

AV2 585FS
(with integrated speakers)
15"/13.75 viewable
0.28mm dot pitch



AV2 785F
17"/15.8 viewable
0.28mm dot pitch
AV2 765F
17"/15.8 viewable
0.26mm dot pitch

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Tap Win 95's Diagnostics

WINDOWS 95 WON'T bring you trouble-free operation, but it will bring you plenty of tools for troubleshooting your hardware. Knowing a little about these tools can save you lots of time when problems crop up or you just need to squeeze a little extra performance out of your computer.

Unlike Windows 3.*x*, Windows 95 consolidates most hardware configuration information into a single database: the Registry. But directly accessing the Registry (via *Start•Run*, typing **regedit**, and clicking *OK*) puts your hands on some machinery that's easy to break—and hard to fix. Fortunately, you can take a less risky path via Windows 95's powerful diagnostic tool, Device Manager.

Device Manager should be your first stop in any investigation of how your computer is configured and where its problems are. From the Control Panel, double-click the *System* icon and then select the *Device Manager* tab. You'll see a window with an Explorer-like tree structure that lists the hardware currently installed on your system (see **FIGURE 1**).

GET A COMPLETE REPORT

ONE OF DEVICE MANAGER'S handiest features is the System Resource Report. Available only in printed form or in a .prn file that can be printed later, the report provides a comprehensive summary of your hardware. To print it, click the *Print* button at the bottom of the Device Manager screen, then select *All Devices and system summary* under Report Type.

Keep a hard copy on file for emergencies. This listing of IRQ assignments, I/O addresses, hard disk parameters, and other resources can be a lifesaver.

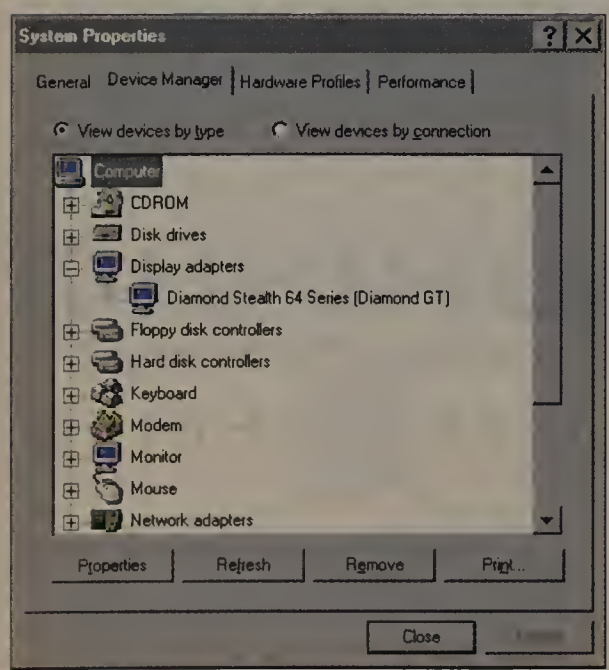

FIGURE 1: DEVICE MANAGER makes it relatively easy to troubleshoot your Windows 95 PC.

TIME TO CHANGE DRIVERS?

MOST OF THE INFORMATION listed in the System Resource Report can be found in Device Manager, and you can change most of the settings there as well.

One example is *device drivers*, the small programs that let Windows 95 and hardware devices talk to each other. Windows 95 doesn't always provide the most up-to-date driver for each device.

But changing a driver in Device Manager is easy. Let's say you've downloaded the latest Windows 95 driver for your Diamond Stealth graphics card. Just double-click the *Display Adapters* icon, double-click the Diamond Stealth icon that pops up on the screen, and then click the *Driver* tab, the *Change Driver* button, and finally the *Have Disk* button. Then use *Browse* to select the driver file.

CONSERVE SCARCE RESOURCES

WINDOWS 95's Device Manager also lets you easily identify and set IRQs, DMAs, I/O ports, and memory addresses. You can find a complete list of hardware assignments for each of these system resources by double-clicking the *Computer* icon at the top of Device Manager's hardware list, which brings up the Computer Properties window.

The Reserve Resources tab in this window lets you save a specific resource—say, IRQ 5—from the greedy clutches of Windows 95.

You also can identify resource conflicts quickly. Look for a yellow dot with an exclamation point on top of the icon for a particular device. This indicates a resource conflict (although sometimes it's a false alarm). For more clues about the conflict, double-click the yellow dot, select the *Resources* tab, and look at the box labeled *Conflicting Device List*. A red X on an icon means the device is disabled.

Once you've found a conflict, select *Start•Help*, click the *Index* tab, type **hardware conflict troubleshooter**, and press **<Enter>** to bring up a Help wizard that will aid you in solving the problem.

WATCH WHAT'S HAPPENING

SYSTEM MONITOR IS another great utility on the Windows 95 CD, but not installed by default. It tracks more than 30 performance measures, including available memory, swap file size, and processor usage through colorful, real-time graphs (see **FIGURE 2**).

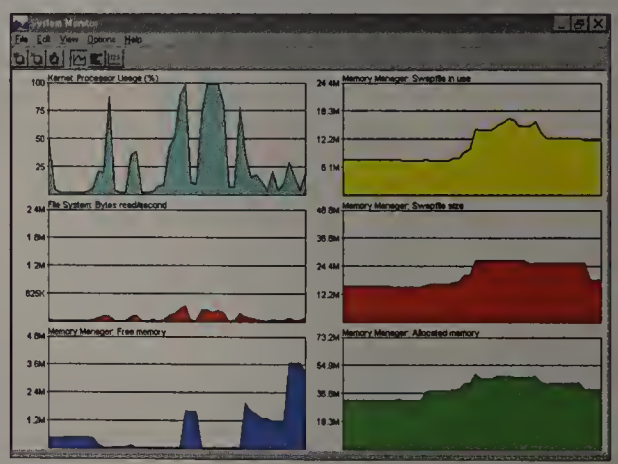

FIGURE 2: SYSTEM MONITOR helps you pinpoint problems such as applications that hog resources.

To choose the graphs to display, select *Edit/Add Item* to open the Add Item window, then click a category and an item. Suppose, for example, you want to find out how much memory your word processor is using. Display the 'Free memory' graph under the Memory Manager category. Open your word processor, perform a few tasks, and close it. The graph will show a jump that reveals how much memory was consumed.

For advice on other troubleshooting tools, visit http://www.pcworld.com/hereshow. Kirk Steers is a PC World *contributing editor.* Hardware Tips *welcomes your questions and pays $50 for published items. See page 14 for contact information.* ■

Are Files You Can't Use Keeping You In The Dark?

MacOpener opens Macintosh floppies, CD-ROMs, and removable cartridges on your PC!

If you're in the dark and blind-sided, because the file you need is on a Mac disk that you can't open on your PC, you need MacOpener. It's the fast, easy way to access any Mac formatted disk on your PC.

Don't let Mac/PC incompatibility leave you in the dark again. Get MacOpener, the utility that lets you see Mac disks and cartridges on your PC, just as if they were PC disks.

You'll find MacOpener at leading software dealers for about $49.

Conversions Plus includes MacOpener. And it also converts files so you can use them in the software of your choice!

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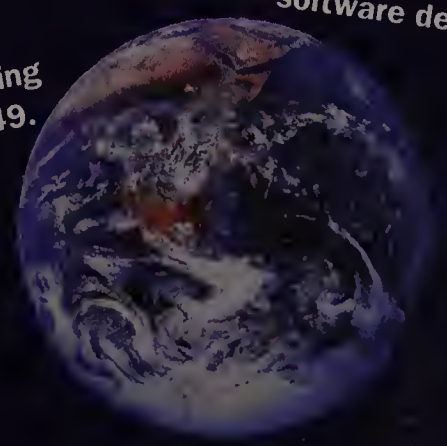
You'll find Conversions Plus at leading software dealers for about $99.



Both products run under Windows 95, Windows 3.1 and Windows NT

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Speed Up Your CD-ROMs

EVER WONDER IF you're getting the best performance from your CD-ROM drive when running multimedia discs? As with your hard drive, Windows sets aside a certain amount of memory to store information likely to be needed next from your CD-ROM drive, and sometimes Windows doesn't create a big enough cache for the drive. Or perhaps you've added more memory to your system (never a bad idea), and Windows didn't adjust the cache size for your CD-ROM drive.

To see if you can increase the cache size Windows 95 uses, right-click *My Computer* and choose *Properties*. Click the *Performance* tab, the *File System* button, and the *CD-ROM* tab. Experiment by changing the supplemental cache size and CD-ROM 'optimize access pattern for:' speed settings to see if you get better performance. If appropriate, set the supplemental cache size to *Large* and the speed settings for *Quad-speed or higher*. Click *OK* to finish. Now go back to your multimedia disc and see if the performance has improved. If not, go back and change the CD-ROM settings to the defaults.

CREATE STILLS FROM MOTION VIDEO

I WANT TO CONVERT pictures from a company-training videotape into still frames that I can use for presentations and Web pages. What low-cost equipment will let me do this?

Bruce Anderson, Plainview, New York

THESE DAYS IT'S EASY and cheap to capture single frames from videotape and convert them into 24-bit color digital images. In the past, you had to spend a small ransom on a video capture board (also called a *frame grabber*) and install it in your PC to get the job done. But today there are video capture devices under $200 that you can easily attach to your PC's parallel port and then hook up to any video source, such as a VCR, camcorder, TV, or laser disc player, using standard (included) video input/output cables.

Check out Play Inc.'s Snappy and Aims Lab's GrabIt. What I like about these gadgets is that each requires such a low level of technical expertise. The external hardware devices consist merely of a small gizmo the size of a TV remote control, so they're convenient to take into the field—say, in tandem with a camcorder and a notebook computer.

Each product's bundled software is a marvel of simplicity, making it easy to preview and capture the video frames you want. GrabIt takes a six-frame sequence and lets you choose which frames you want to save (see **FIGURE 1**). Snappy takes a single frame at a time (see **FIGURE 2**).

You can also select different resolutions—as high as 1500 by 1125 pixels with Snappy and 720 by 480 with GrabIt—and tweak captured images' brightness and contrast (and perform other basic adjustments) before saving them in JPEG, TIFF, BMP, or other bit map file formats.

Each product comes with additional image manipulation and special effects software, but bear in mind that the overall quality of the video stills you capture is determined largely by the quality of the original video source. In general, a live video source from a TV or camcorder will yield higher-quality video stills than a recorded videotape. Also, the average horizontal resolution of standard camcorder formats (VHS, VHS-C, 8mm) is only about 240 lines, while the higher-quality formats (Super-VHS, S-VHS-C, Hi8) offer about 400 lines. So be sure to use the best camcorder that you can get your hands on.

Play Inc. and Aims Lab provide sample video stills and free downloadable demos of their video capture products at each company's Web site.

FIGURE 2: YOU CAN ENHANCE VIDEO SNAPSHOTS with Snappy's image adjustment features before saving them.

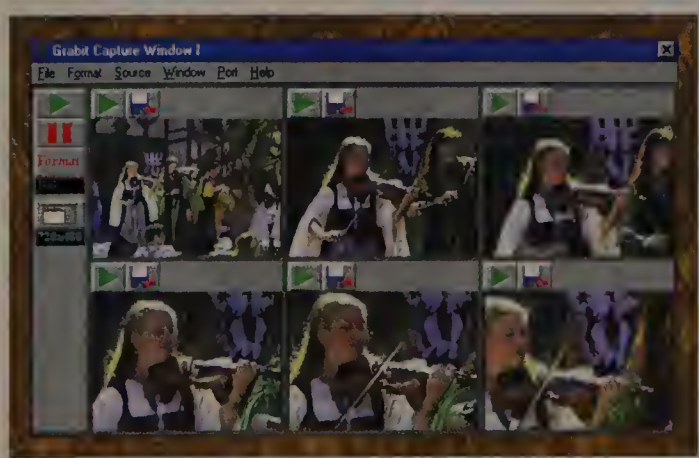

FIGURE 1: CAPTURE FRAMES FROM FULL-MOTION VIDEO with Aims Lab's GrabIt, a parallel port device.

- GrabIt $139.95 list; Aims Lab; 510/661-2525; http://www.aimslab.com

READER SERVICE NO. 688

- Snappy 2.0 $199.95 list; Play Inc.; 800/306-7529; http://www.play.com

READER SERVICE NO. 689

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SEARCHING THE NET for the best free sound recordings and utilities can be a daunting task. Visit the Australian Music Monolith (http://hitsquad.thehub.com.au/monolith/), an expedient place to locate sites specializing in sound, music, and voice recordings, as well as free or cheap sound editing programs. You'll find plenty of links to music-related sites dedicated to everything from classical music to terminally hip bands.

Find additional tips at http://www.pcworld.com/hereshow. Multimedia Tips *welcomes your questions and tips and pays $50 for published items. Richard Jantz is a consultant and freelance writer in Kensington, California. See page 14 for contact information.* ■

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Install a Removable-Cartridge Disk Drive

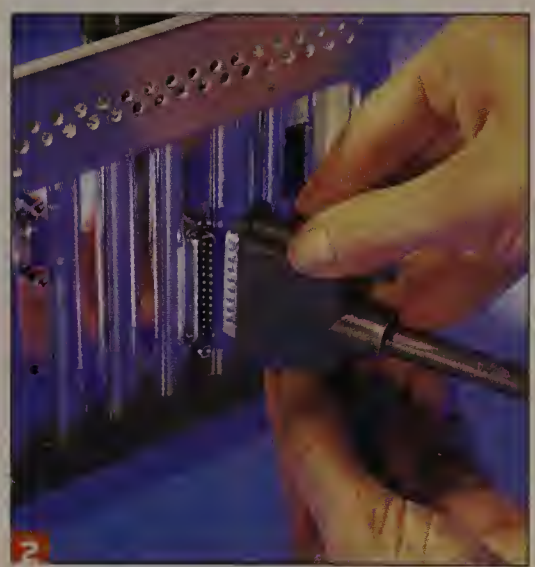
GOT THE GIMMES for a removable cartridge disk drive, like the Zip? It's easy to understand why. Such a drive has oodles of uses, from storing large multimedia files to keeping confidential information locked away to backing up hard disks.

The Zip drive, available from either Iomega or Epson, is by far the most popular. It costs around $150 to $200 and takes 100MB cartridges that sell for less than $20. Rival drives, like SyQuest's 1.5GB SyJet 1.3, cost up to $500, with cartridges priced about $100. These drives generally come in both internal and external models. External drives are usually available in parallel and SCSI versions. The parallel models are easy to hook up and move between PCs, but data transfer is slow. The SCSI versions are fast enough even to run applications but require a SCSI adapter.

Here's a quick overview of installing an external drive. For more detailed information, plus tips on installing internal drives, check out http://www.pcworld.com/hereshow.

Stan Miastkowski is a PC World *contributing editor.*

Identify the connectors. A parallel drive (top) has one 25-pin male connector for the cable to your PC and one 25-pin female connector for your printer cable. A SCSI drive has one connector for the PC cable and one for another SCSI device's cable.

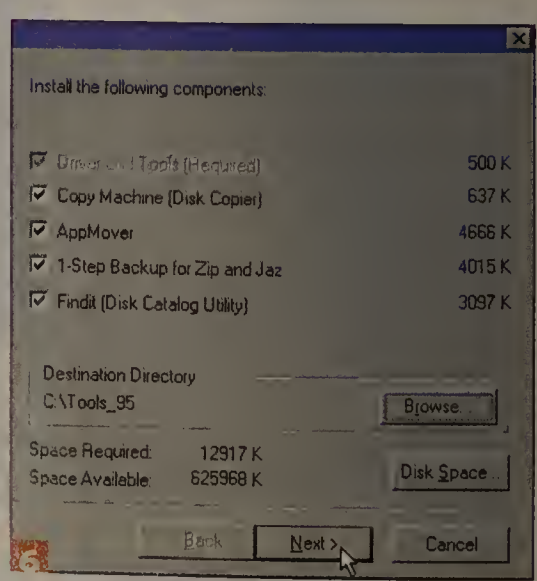


Hook up to a parallel port. Shut down your PC. Disconnect your printer cable if you have one. Connect your PC's parallel cable to the parallel drive's connector. If you've got a printer, connect its cable to the rear of the drive. Go to Step 5.

Hook up to a new SCSI adapter. If your PC has a SCSI port, skip to Step 4. If not, you'll need a SCSI add-in card. Shut down your PC, remove the cover, and follow the directions that come with the SCSI card. Connect the drive to the card. Go to Step 5.

Hook up to an existing SCSI adapter. Shut down your PC. Connect the cable from the removable cartridge drive to your PC's external SCSI connector. Set the drive's SCSI ID; you may also need to set your adapter to recognize an external drive. Go to Step 5.

Check your connections. Hook up the AC power connector to a wall socket and to the removable cartridge drive. Double-check all your cable connections. Power up your PC. If your removable cartridge drive has a power switch (most don't), turn it on.



Install the software. Check your new drive's manual for instructions on installing software. Typically, you run a setup program from a standard floppy disk and place a Tools disk cartridge in the drive. Problems? Shut down and recheck your connections. ■

PHOTOGRAPHS: KEVIN CANDLAND

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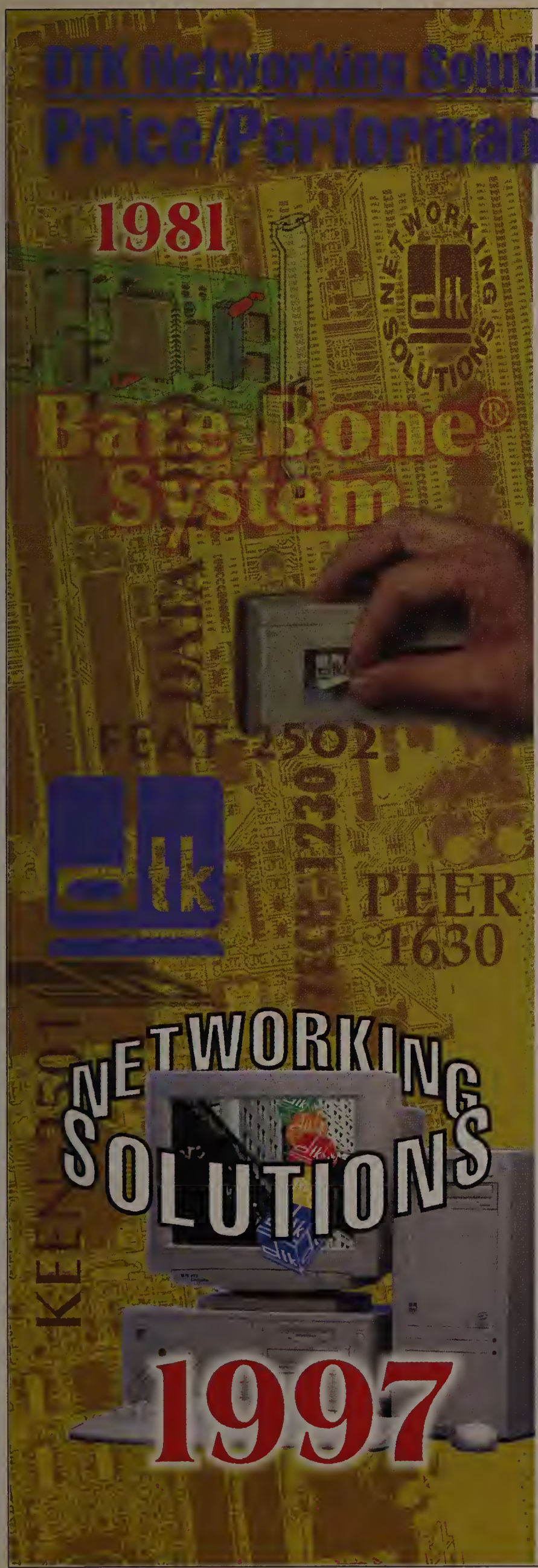

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PC World January 1997 - Top 20 Systems Review

DTK QUIN-55M/Pentium® Processor/200MHz	**#20**	Power PCs
DTK QUIN-55M/Pentium® Processor/133MHz	**#9**	Budget PCs
DTK DTN-5A Pentium® Processor/120MHz	**#10**	Budget Notebooks

"HP, DTK lead the Pentium Pro pack"

"The DTK APRI-31M/P200 is a price/performance leader, and an excellent value." Computer Reseller News, 9/2/96

"If you need a high-speed, easily configured and expandable system at a good price, the DTK APRI-31M system is an excellent value." Windows NT Magazine, 2/97

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PC World *March 1996*

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LAN Times *Feb.19,1996*

"LapLink is the easiest program to use, and it's one of the fastest and steadiest."

Federal Computer Week *Feb. 6,1996*

"After hours of testing, a clear usability winner emerged-LapLink was far and away our testers top choice for fuss-free remote access to files, programs, or a network, and for remote training and technical support."

PC/Computing *Sept. 1996*

"LapLink consistently outperformed pcAnywhere on our network. With LapLink, we felt as though the remote system was performing tasks locally, but when we switched to pcAnywhere we still felt as though we were using a modem."

PC Magazine *March 26, 1996*

"...if you haven't upgraded your LapLink in a while, it's time to do it again. LapLink for Windows 95 is good."

BYTE *May 1996*

"LapLink is a powerhouse for, and the granddaddy of, remote computing."

Home Office Computing *May 1996*

"LapLink is a superior remote access client for telecommuters, remote offices and even local clients"

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"When we matched it up against Symantec's pcAnywhere32 in our labs, we found that LapLink is the product we'd want with us on the road."

PC/Computing *May 1996*

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LAN Magazine *June 1996*

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Info World *Jan.29,1996*

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Computer industry experts aren't in the habit of agreeing with each other. When they do, it's definitely worth noting.

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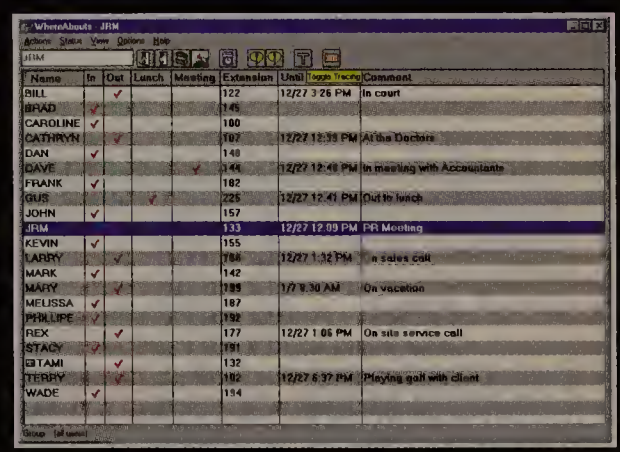
WhereAbouts?

THE ON-LINE IN/OUT BOARD FOR YOUR LAN

Now you can find a co-worker instantly so your clients can place their orders instead of being left on hold, or worse, sent to voice-mail jail! Today's modern office tool, *WhereAbouts?*, is an Online In/Out board for your whole company, which allows you to quickly and easily keep track of your staff throughout the day with one quick glance. Amazingly, *WhereAbouts?* automatically marks you in or out so your people can improve customer satisfaction immediately without changing the way they work today. *WhereAbouts?* sets up in seconds and pays off in minutes.



Name	In	Out	Lunch	Meeting	Extension	Until	Comment
BILL		✓			122	12/27 3:26 PM	In court
BRAD	✓				145		
CAROLINE	✓				100		
CATHRYN		✓			107	12/27 12:35 PM	At the Doctors
DAN	✓				148		
DAVE				✓	145	12/27 12:48 PM	In meeting with Accountants
FRANK	✓				182		
GUS			✓		225	12/27 12:41 PM	Out to lunch
JOHN	✓				157		
JRM					133	12/27 12:09 PM	PR Meeting
KEVIN	✓				155		
LARRY		✓			188	12/27 1:32 PM	n sales call
MARK	✓				142		
MARY		✓			189	1/7 9:30 AM	On vacation
MELISSA	✓				187		
PHILLIPE	✓				192		
REX		✓			177	12/27 1:05 PM	On site service call
STACY	✓				191		
TAMI		✓			132		
TERRY		✓			182	12/27 6:37 PM	Playing golf with client
WADE	✓				194		

"***WhereAbouts?*** is one of those programs that, once you see it, makes you wonder why no one has done this before." *InfoWorld - April 1995*

"***WhereAbouts?*** is a straight-forward and user-friendly product." *PC Magazine - September 1995*

"PC Week Labs found that ***WhereAbouts?*** unobtrusively solves several business problems." *PC Week - July 1995*

"For security and detailed reporting, ***WhereAbouts?*** is the right choice." *Government Computer News - May 1996*

Here are a few companies using *WhereAbouts?* today:

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- Honeywell • Naval Surface Warfare Center
- AT&T • MCI • US Department of Commerce
- Orange County Department of Welfare
- Unisys • US Senate • World Bank of Canada
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ThinkPad® 760EL as low as $4999
3-Year TAP Warranty..... $99.97
5-Year TAP Warranty... $459.97

ThinkPad® 760

- Up to 150MHz Pentium processors
- Built-in CD-ROM drives on 760ED
- 16-bit SoundBlaster compatible audio
- Built-in 28.8 fax modems on selected models
- 11.3" and 12.1" Super VGA displays

PC MAGAZINE EDITORS' CHOICE

Model	CPU	Screen	RAM/HD	CD	Price
760EL	133MHz	12.1" Active	16MB/2.1GB	Opt.	$4999
760ED	133MHz	12.1" Active	16MB/1.2GB	4X	5399
760E	150MHz	12.1" Active	16MB/2.1GB	Opt.	5699
760ED	133MHz	12.1" Active	16MB/2.1GB	6X	5999

Additional models available. Call for details.

ThinkPad® 365XD

ThinkPad® 365X as low as $1999
3-Year TAP Warranty... $199.97
5-Year TAP Warranty... $299.97

ThinkPad® 365X & XD

- Up to Pentium 133MHz processors
- Up to 6X CD-ROM drive on 365XD
- 10.4" & 11.3" SVGA displays
- 16-bit sound, speakers and microphone
- Infrared port for wireless communications
- External floppy drive on 365XD

Call about 4.1 lb ThinkPad 560 models

Model	CPU	Screen	RAM/HD	CD	Price
365X	133MHz	11.3" Dual Scan	8MB/1.1GB	Opt.	$1999
365XD	120MHz	10.4" Active	8MB/1.1GB	6X	2099
365XD	133MHz	11.3" Active	8MB/1.4GB	6X	2999

New models available. Call for details

TOSHIBA

FREE PORT REPLICATOR WITH SATELLITE 110 PURCHASE. WHILE SUPPLIES LAST.

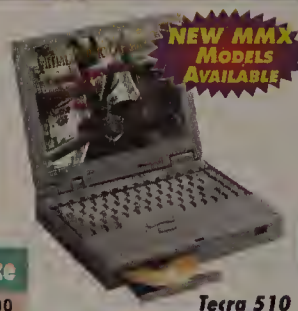
Satellite Pro 430

Satellite Pro 420 & 430

- Up to Pentium 120MHz processors
- Up to 10X CD-ROM drives
- 11.3" Dual Scan & Active Matrix displays
- Built-in SoundBlaster Pro compatible audio

Satellite Pro 420CDS as low as $1699
3-Year TAP Warranty.....$99.97
5-Year TAP Warranty....$299.97

Model	CPU	Screen	RAM/HD	CD	Price
420CDS	100MHz	11.3" Dual Scan	8/772MB	6X	$1699
430CDS	120MHz	11.3" Dual Scan	16MB/1.2GB	10X	CALL
420CDT	100MHz	11.3" Active	8MB/1.2GB	6X	2499
430CDT	120MHz	11.3" Active	16MB/1.2GB	10X	2989



NEW MMX MODELS AVAILABLE

Tecra 510

Call about 200, 660, 730 & 740 models

Tecra 500 & 510

- 120 & 133MHz processors
- Up to 10X CD-ROM drives on selected models
- 16MB EDO RAM memory
- 12.1" Super VGA displays

Tecra 500CS as low as $1799
3-Year TAP Warranty..... $99.97
5-Year TAP Warranty... $299.97

Model	CPU	Screen	RAM/HD	CD	Price
500CS	120MHz	12.1" Dual Scan	16MB/1.3GB	Opt.	$1799
500CDT	120MHz	12.1" Active	16MB/1.3GB	6X	3549
510CDT	133MHz	12.1" Active	16MB/2.1GB	10X	4599

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CALL ABOUT NEW LIFEBOOKS

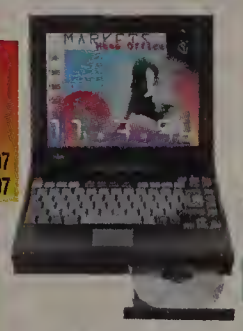
LifeBook™ 500 Notebook

- Up to 150MHz Pentium processors
- Built-in 6X CD-ROM drives
- Up to 12.1" displays
- 28.8 fax modem on selected models

Lifebook™ 520D as low as $1799
3-Year TAP Warranty..... $99.97
5-Year TAP Warranty... $299.97

Model	CPU	Screen	RAM/HD	CD	Price
520D	120MHz	11.3" Dual Scan	8/810MB	6X	$1799
520T	120MHz	11.3" Active	8/810MB	6X	2499
530T	133MHz	11.3" Active	16MB/1.3GB	6X	2999 *
555T	150MHz	11.3" Active	16MB/1.3GB	6X	3999 *

* Includes built-in 28.8 fax modem



LifeBook™ 500 Notebook

LifeBook™ 600 Notebook

- 133MHz Pentium processors
- Only 1.2" thick and 4.2 lbs.
- 12.1" Active Matrix displays
- Integrated 28.8 fax modem

Lifebook™ 635T as low as $3999
3-Year TAP Warranty..... $99.97
5-Year TAP Warranty... $499.97

Model	CPU	Screen	RAM/HD	CD	Price
635T	133MHz	12.1" Active	16MB/1.3GB	Opt.	$3999
635T	133MHz	12.1" Active	16MB/1.3GB	Opt.	3999 *

* Includes Windows for Workgroups or Windows 95

LifeBook™ 600 Notebook

Additional models are available with Windows for Workgroups or Windows 95

digital™

MMX MODELS NOW AVAILABLE

HiNoteVP & VP 500

HiNote VP as low as $1499
3-Year TAP Warranty... $149.97
5-Year TAP Warranty... $229.97

SPECIAL PRICE

Model	CPU	Screen	RAM/HD	CD	Price
HiNote VP	120MHz	11.3" Dual Scan	8MB/1.0BGB	Opt.	$1499
VP 520	120MHz	11.3" Dual Scan	8MB/1.08GB	6X	2449
VP 525	120MHz	11.3" Active	8MB/1.0BGB	6X	2949
VP 535	133MHz	12.1" Active	8MB/1.44GB	6X	3599
VP 545	150MHz MMX	12.1" Active	8MB/1.44GB	6X	3899

HiNote VP 500

HiNote Ultra II

- Only 1.2" thick and 4.0 lbs!
- Up to 150MHz Pentium processors
- 11.3" Super VGA, Active Matrix displays
- 16MB of RAM memory

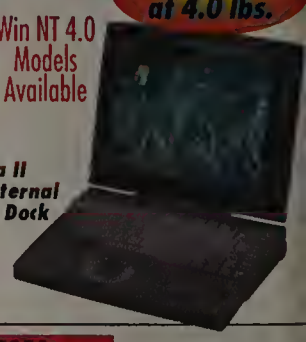
HiNote Ultra II as low as $4499
3-Year TAP Warranty..... $99.97
5-Year TAP Warranty... $599.97

Win NT 4.0 Models Available

Super Light at 4.0 lbs.

Model	CPU	Screen	RAM/HD	CD	Price
Ultra II	133MHz	11.3" Active	16MB/1.35GB	Opt.	$4499
Ultra II	150MHz	11.3" Active	16MB/1.44G	Opt.	4799*
Ultra II	133MHz	11.3" Active	16MB/1.35GB	Opt.	4699**
Ultra II	150MHz	11.3" Active	16MB/1.44G	Opt.	4799

* Features Win for Workgroups ** Features Win NT



Ultra II with external Floppy Dock

COMPAQ

Presario Notebook

- 133MHz Pentium processor
- 10X CD-ROM drive
- 128-bit PCI graphics
- Built-in 33.6 fax modem
- Integrated PremierSound audio
- MS Works, Quicken and more!

Presario

Presario 1070 as low as $2899
3-Year TAP Warranty... $259.97
5-Year TAP Warranty... $399.97

Model	CPU	Screen	RAM/HD	CD	Price
1070	133MHz	12.1" Dual Scan	16MB/1.1GB	10X	$2899

LTE 5000

Model	CPU	Screen	RAM/HD	CD	Price
5250	120MHz	10.4" Active	16/810MB	Opt.	$3099
5280	120MHz	11.3" Active	16MB/1.35GB	Opt.	3859
5300	133MHz	12.1" Active	16MB/1.35GB	Opt.	4349
5380	133MHz	12.1" Active	16MB/2.2GB	Opt.	5439
5400	150MHz	12.1" Active	32MB/2.2GB	Opt.	5539

Call about value priced Armada Notebooks!

LTE 5250 as low as $3099
3-Year TAP Warranty..... $99.97
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LTE 5000

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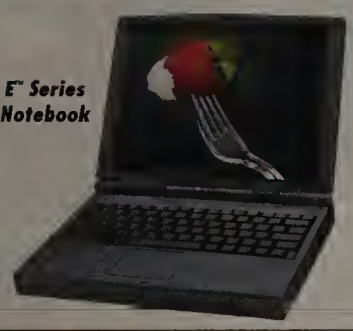
Hitachi E™

- PCMCIA 28.8 cellular ready fax/modem
- 11.3" Super VGA display
- Only 1.6" thick and 5.8 lbs.

Model	CPU	Screen	RAM/HD	CD	Price
E133T	133MHz	11.3" Active	16MB/1GB	8X	$2199



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E133T as low as **$2199**
3-Year TAP Warranty... $229.97
5-Year TAP Warranty... $349.97

Hitachi M™ & Mx™

- Integrated 10BaseT Ethernet card
- Built-in cellular data/fax/modem
- 5 year warranty
- Up to 8X CD-ROM drives

Model	CPU	Screen	RAM/HD	CD	Price
M120D	120MHz	11.3" Dual Scan	16MB/1.0GB	6X	$2199
MX133T	133MHz	12.1" Active	16MB/1.35GB	8X	3999
MMX166T	166MMX	12.1" Active	16MB/2.1GB	8X	5199

M120D as low as **$2199**
5-Year TAP Warranty... $349.97

Mx™ Series Notebook

NEC

6200MX

Model	CPU	Screen	RAM/HD	CD	Price
6200MX	166MHz MMX	13.3" Active	32MB/2.1GB	10X	$6399

6050

Model	CPU	Screen	RAM/HD	CD	Price
6050H	150MHz MMX	12.1" Active	16MB/1.4GB	10X	$4699
6050MX	150MHz MMX	12.1" Active	16MB/2.1GB	10X	5199

13.3" DISPLAY

Versa 6200MX **$6399**
3-Year TAP Warranty.....$99.97
5-Year TAP Warranty... $799.97

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Versa 6200

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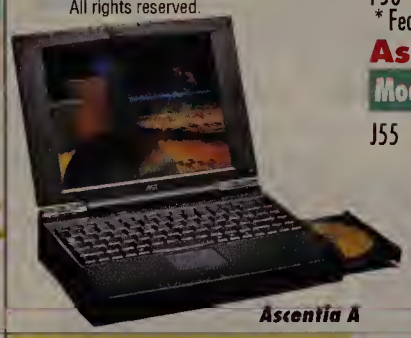

Ascentia A

Ascentia A & P

Model	CPU	Screen	RAM/HD	CD	Price
A41	120MHz	11.3" Dual Scan	16MB/1.0GB	6X	$2199
A42	120MHz	12.1" Active	16MB/1.0GB	6X	2799
P50	133MHz	12.1" Active	24MB/1.0GB	6X	3699*
P50	133MHz	12.1" Active	24MB/2.1GB	6X	4299*

* Features 28.8 fax modem

Ascentia J

Model	CPU	Screen	RAM/HD	CD	Price
J55	133MHz	11.3" Active	16MB/1.0GB	Opt.	$2399

Ascentia A41 as low as **$2199**
3-Year TAP Warranty... $229.97
5-Year TAP Warranty... $349.97

SHARP

WideNote

Model	CPU	Screen	RAM/HD	CD	Price
W100D	133MHz	11.2" Wide Dual Scan	16MB/1.1GB	Opt.	$2799
W100T	133MHz	11.2" SHA Wide Active	16MB/1.1GB	Opt.	3299

9300

Model	CPU	Screen	RAM/HD	CD	Price
9300D	150MHz	12.1" Dual Scan	16MB/1.4GB	10X	$2699
9300T	150MHz	11.3" Active "SHA"	16MB/1.4GB	10X	3199

9300D Only **$2699**
3-Year TAP Warranty.... $ 99.97
5-Year TAP Warranty.. $ 399.97

Ask About Sharp's Super-Light Zaurus PDAs

Sharp 9300

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Echos

Model	CPU	Screen	RAM/HD	CD	Price
Echos	100MHz	11.3" Dual Scan	8MB/1.3GB	6X	$1699
Echos	100MHz	10.4" Active	8MB/1.3GB	6X	1999
Pro	133MHz	12.1" Dual Scan	16MB/1.3GB	8X	2999
Pro	133MHz	12.1" Active	16MB/2GB	8X	3499
Pro	150MHz	12.1" Active	16MB/2GB	8X	3999

UP TO 8X CD-ROM

UP TO 150MHz PROCESSORS

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3-Year TAP Warranty... $199.97
5-Year TAP Warranty... $299.97

Olivetti Echos Notebook

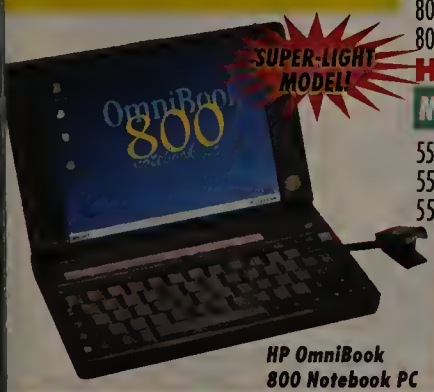
HEWLETT® PACKARD

HP OmniBook 800

Model	CPU	Screen	RAM/HD	CD	Price
800CS	100MHz	10.0" Dual Scan	16/810MB	Opt.	$2449
800CT	133MHz	10.4" Active	16MB/1.4GB	Opt.	3469

HP OmniBook 5500

Model	CPU	Screen	RAM/HD	CD	Price
5500CTS	120MHz	10.4" Active	16MB/1.35GB	Opt.	$2749
5500CTS	133MHz	12.1" Active	16MB/1.35GB	Opt.	3279
5500CTS	133MHz	12.1" Active	16MB/2GB	Opt.	3549



SUPER-LIGHT MODEL!

HP OmniBook 800 Notebook PC

HP Omnibook 800CS as low as **$2449**
3-Year TAP Warranty..... $99.97
5-Year TAP Warranty... $349.97

Additional 5500 models available. Call for details.

TEXAS INSTRUMENTS

Extensa 650

Model	CPU	Screen	RAM/HD	CD	Price
650CDT	133MHz	11.3" Dual Scan	16MB/2.1GB	10X	$2729

TravelMate 6000

Model	CPU	Screen	RAM/HD	CD	Price
6030	133MHz	12.1" Active	16MB/1.35GB	6X	$3399
6050	150MHz	12.1" Active	16MB/1.35GB	6X	3699
6160	166MHz MMX	12.1" Active	32MB/2.1GB	10X	4899

Extensa 650CDT
Product differs slightly from photo

Extensa 650CDT as low as **$2729**
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5-Year TAP Warranty... $399.97

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- Place tower up to 6 ft. away
- 33.6 or 28.8 data/fax/voice modem with telephony
- Pentium MMX™ technology (on selected models)
- Integrated audio on optional monitor
- Vivid graphics with Total Image 3D™
- 3D stereo sound with Theater Sound™

Model	CPU	RAM/HD	CD	Price
S64	166MHz	16MB/2.5GB	BX	$1799
S76	200MHz	32MB/2.5GB	BX	1999
S66	166MHz	16MB/3.2GB	BX	2169*
SB0	166MHz MMX	32MB/3.2 GB	BX	2199*
S90	200MHz MMX	32MB/3.2 GB	BX	2399*

* Cordless mouse and joystick included

Aptiva S Monitors

Model	Size	View	Resolution	Price
MM50	15"	13.7"	1024 x 76B	$499
MM70	17"	15.7"	1024 x 76B	799

Aptiva C Models also available

Monitors priced separately

IBM Aptiva S Multimedia

Unique MediaConsole™ puts your CD-ROM, floppy and controls at your fingertips.

Aptiva S64 as low as $1799

3-Year TAP Warranty..... $99.97
5-Year TAP Warranty... $299.97

COMPAQ

MMX intel inside pentium

33.6 SPEED DATA/FAX MODEM

We are Compaq Authorized

Monitors priced separately

Compaq Presario Multimedia

Presario Multimedia

- 16X CD-ROM drives
- 3D surround sound with JBL Pro speakers
- Tons of FREE educational and business software
- 33.6 data/fax/modem
- Up to 3.8 GB hard drives

16X CD-ROM

Presario 4764 as low as $1899

3-Year TAP Warranty... $199.97
5-Year TAP Warranty... $299.97

Model	CPU	RAM/HD	CD	Price
4764	166MHz MMX	24MB/2.5GB	16X	$1899
4770	200MHz MMX	32MB/3.BGB	16X	2299

Presario Monitors

Model	Size	View	Resolution	Price
Presario	14"	12.9"	1024 x 768	$399
Presario	15"	13.5"	1024 x 76B	479
Presario	17"	15.6"	1280 x 1024	749

HEWLETT® PACKARD

16X CD-ROM

MMX intel inside pentium

Monitors priced separately

HP Pavilion Multimedia

Pavilion 7320 as low as $1799

3-Year TAP Warranty... $199.97
5-Year TAP Warranty... $299.97

Pavilion Multimedia

- 16X CD-ROM drives
- Up to 200MHz MMX Pentium processors
- Tons of FREE CD-ROM titles
- 33.6 data/fax modem with speaker phone
- 16MB or 32MB EDO RAM memory
- 3D stereo audio and graphics

Model	CPU	RAM/HD	CD	Price
7320	166MHz MMX	16MB/2.1GB	16X	$1799
7360	200MHz MMX	32MB/3.8GB	16X	2399

Pavilion Monitors

Model	Size	View	Resolution	Price
Pavilion	15"	13.8"	1024 x 768	$449
Pavilion	17"	15.7"	1024 x 768	749

Monitors priced separately

TOSHIBA

UP TO 200 MHz PENTIUM

Infinia Multimedia

- Up to 200MHz Pentium processors
- 8X CD-ROM drive
- 28.8 full duplex data/fax modem
- 2MB EDO video RAM
- Tons of FREE software

PC MAGAZINE EDITORS' CHOICE

3-D Surround Sound

Model	CPU	RAM/HD	CD	Price
7130	133MHz	16MB/1.6GB	BX	$1299
7160	166MHz	16MB/2.1GB	8X	1599
7200	200MHz	16MB/3.0GB	BX	2199

Infinia Monitors

Model	Size	View	Resolution	Price
Infinia	15"	13.78"	12B0 x 1024	$459
Infinia	17"	16.23"	12B0 x 1024	759

InTouch™ Module. Jump from CD to TV to radio to answering machine, each with the touch of a button.

Standard on select models.

Infinia 7130 as low as $1299

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5-Year TAP Warranty... $229.97

Monitors priced separately

Toshiba Infinia Multimedia

NEC

Ready Multimedia

- Up to 200MHz processors with MMX technology
- 8X and 16X CD-ROM drives and audio wavetable
- 33.6 data/fax/modem
- 256KB cache memory
- 4MB standard video memory
- Tons of FREE software
- Up to 3.2GB hard drives

16X CD-ROM

MMX intel inside pentium

Model	CPU	RAM/HD	CD	Price
9710	166MHz MMX	16MB/2.1GB	BX	$1799
9712	166MHz MMX	32MB/3.2GB	16X	1999
9716	200MHz MMX	32MB/3.2GB	16X	2199

Monitors priced separately

Monitors priced separately

Ready Multimedia as low as $1799

3-Year TAP Warranty... $199.97
5-Year TAP Warranty..... 299.97

Additional models available. Call for details.

NEC Ready Multimedia
Product differs slightly from photo

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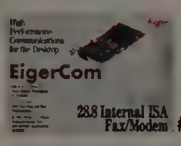
28.8 Fax/Modem with speaker



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EFX-2880N

28.8 PCMCIA Fax/Modem

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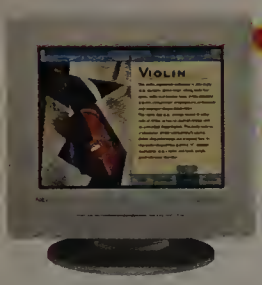
EFX-2880PL

NEC XV17+



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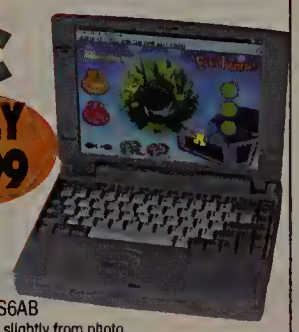

PA1224U-S6AB
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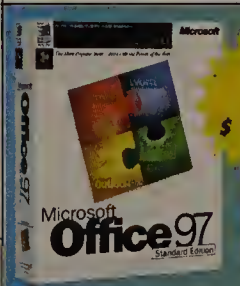

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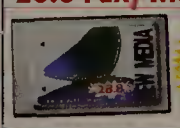

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4079 Plus	$2439
4226 Dot Matrix	$1269
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Optra E	$539
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TM 6030, P133, 12.1" Act., 1.35GB	$3360
TM 6050, P150, 12.1" Act., 1.35GB	$3649
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Armada 4130T, P100, 11.8"Act, 1.08GB	$3899
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Aptiva M Series	4Meg/8Meg/16Meg/32Meg	24/49/99/169
PC 330 Models 6571-6576	4Meg/8Meg/16Meg/32Meg	24/49/99/169
PC 330 Model 6577 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	24/49/99/169
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PC Server 500 (ECC, pairs)	4Meg/8Meg/16Meg/32Meg	59/79/119/249
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P/S 1, 72 Pin Simms	4Meg/8Meg/16Meg/32Meg	39/59/109/199
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P/S 2, 53, 53LS, 56, 57	4Meg/8Meg	39/69
P/S 2, 95XP (ECC, pairs)	4Meg/8Meg	49/79
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Thinkpad 701, 701C	4Meg/8Meg/16Meg/32Meg	49/69/139/649
Thinkpad 730T, TE	4Meg/8Meg/16Meg	49/109/189
Thinkpad 755C, CE, CD, CS	4Meg/8Meg/16Meg/32Meg	39/69/139/259
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Deskpro 3/25I, 33I, 4/25IS, 66I	2Meg/4Meg/8Meg	39/69/89
Deskpro 386, 486 M Series	2Meg/4Meg/8Meg	29/39/69
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Deskpro 5/60M, 5/66M, XE560 (quads)	2Meg/4Meg/8Meg/16Meg/32Meg	39/49/69/139/239
Deskpro XL (pairs)	4Meg/8Meg/16Meg/32Meg	49/69/139/239
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Presario 5536, 9232, 9234, 9240, 9250, 9260, 9642, 9660	1Meg Video	69
Presario 510, 520, 524, 660, 720, 724, 860	4Meg/8Meg/16Meg/32Meg	24/42/79/159
Presario 920, 924, 954, 974, 978, 992	4Meg/8Meg/16Meg/32Meg	24/42/79/159
Presario 833, 850, 860, 866	4Meg/8Meg/16Meg/32Meg	39/64/119/239
Presario 5528, 7110, 7152	4Meg/8Meg/16Meg/32Meg	24/42/79/159
Presario 7170, 7180, 9536, 9546, 9548, 9564 (pairs)	4Meg/8Meg/16Meg/32Meg	24/42/79/159
Presario 9232, 9234, 9240, 9250, 9642, 9660 (pairs)	4Meg/8Meg/16Meg/32Meg	24/42/79/159
Proliant 1000 5/60, 2000, R, 4000, R (quads)	4Meg/8Meg/16Meg/32Meg	36/62/99/189
Proliant 1500, 1500R (pairs)	4Meg/8Meg/16Meg/32Meg	36/62/99/189
Proliant 4500, 4500R (quads)	4Meg/8Meg/16Meg/32Meg/64Meg	39/64/119/239/599
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Prolinea 575, 590, 5100, 5120, 5133 (pairs)	4Meg/8Meg/16Meg/32Meg	36/62/99/189
Prolinea 5100, 5120, 5133, 5150, 5166 (EDO pairs)	4Meg/8Meg/16Meg/32Meg	36/62/99/189
Prolinea 575E, 100E, 120E, 575MX (pairs)	4Meg/8Meg/16Meg/32Meg	36/62/99/189
Prolinea 590MX, 5120MX (pairs)	4Meg/8Meg/16Meg/32Meg	36/62/99/189
Prolinea 6150E, 6180E (pairs)	8Meg/16Meg/32Meg	69/119/239
Prosignia 300 5/75, 5/90, 5/120, 5/150 (pairs)	4Meg/8Meg/16Meg/32Meg	36/62/99/189
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Armada 4100, 4110, 4120, 4130 (pairs)	8Meg/16Meg/32Meg	69/129/249
Concerto 4/25, 433	4Meg/8Meg/16Meg	49/69/139
Contura 4/25, C, CX	4Meg/8Meg/16Meg	49/69/139
Contura 400C, 400CX, 410C, 410CX	4Meg/8Meg/16Meg	49/69/139
Contura 420C, 420CX, 430C, 430CX	4Meg/8Meg/16Meg/24Meg	49/69/139/199
Contura Aero 4/25, 4/33	4Meg/8Meg/16Meg	49/79/1399
LTE 5000, 5100, 5200, 5300	8Meg/16Meg/32Meg/64 Meg Kit	79/129/249/479
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Canon LBP 430	–	–	39	–	–	–	39	–	–	–	–	–
Canon LBP 860, 1260	–	–	–	19	–	–	39	–	–	69	89	179
Canon LBP4, 4Lite, 4plus	–	–	129	179	–	–	–	–	–	–	–	–
Epson 6000, Action Laser	–	–	–	79	–	–	149	–	–	–	–	–
Epson Action Laser 1100, 1600	–	–	19	29	–	–	59	–	–	89	99	–
Epson Action Laser II	–	–	74	–	173	–	–	272	–	–	–	–
Epson 8000, 1800, 4000, 4100, 4300	–	–	89	–	173	–	–	272	–	–	–	–
Epson 1000, 1500, 5000, 5200	–	–	–	69	–	–	138	–	–	–	–	–
HP 2, 2D–	–	–	–	59	–	–	79	–	–	–	–	–
HP 3, 3D, 3P, 2P 2P+	–	–	–	**59**	–	–	**79**	–	–	–	–	–
HP 4, 4M, 4SI, 4SIMX	–	–	–	19	–	–	49	–	–	79	–	–
HP 4P, 4PLUS, 4MPm 1600, 1600CM	–	–	9	19	–	–	39	–	–	69	–	–
HP 4L	–	–	29	–	–	–	–	–	–	–	–	–
HP 3SI	–	–	9	–	–	–	39	–	–	69	–	–
HP 5L	–	–	39	49	–	–	59	–	–	99	–	–
HP 5P, 5MP, 4V, 4MV, 6P, 6MP	–	–	9	19	–	–	39	–	–	69	99	–
HP Design Jet 600, 650, 200	–	–	–	19	–	–	39	–	–	69	109	199
HP Deskjet 500, 500C, 519, 559, 560	–	***29***	–	–	–	–	–	–	–	–	–	–
HP Deskjet 1200C, 1200C/P	–	–	–	39	–	–	49	–	–	89	–	–
HP Paintjet XL300	54	–	–	–	–	–	69	–	–	144	299	–
IBM Laser 4019, 4019E	–	–	–	–	–	119	–	–	–	–	–	–
IBM Laser 4029, 4037	–	–	–	–	–	–	49	–	–	–	–	–
IBM Laser 4039, 4079	–	–	–	***39***	–	–	***69***	–	–	***99***	–	–
Konica LP-3110, 3115	–	–	89	119	159	–	–	–	–	–	–	–
Lexmark Medley 4C, 4x, 4SX	–	–	Call	Call	Call	–	–	–	–	–	–	–
Lexmark, Optra L, LX, R, RX	–	–	–	–	–	–	39	–	–	59	89	169
Lexmark Valuwriter 300,600	–	–	29	39	–	–	89	–	–	–	–	–
Lexmark Winwriter 200, 400, 600	–	–	29	39	–	–	89	–	–	–	–	–
NEC 90, 290	–	–	–	89	–	–	–	–	–	–	–	–
NEC 95, 97	–	–	–	79	–	–	–	–	–	–	–	–
Oki 400	–	–	–	69	–	–	–	–	–	–	–	–
Oki 400E, 400EX, 410E, 410EX	–	–	89	109	169	–	189	–	–	–	–	–
Oki 810E, EX, 600E, EX, 810E, EX	–	–	29	39	–	–	89	–	–	99	129	–
Oki 830, 840	–	–	–	89	–	–	–	–	–	–	–	–
Oki 2350, 2450	–	–	Call	Call	–	–	–	–	–	–	–	–
Panasonic 4420/4450i	–	–	–	79	–	–	149	–	–	–	–	–
Panasonic 4410/4430	–	–	–	***69***	–	–	***109***	–	–	–	–	–
Panasonic 4450	–	–	89	–	–	–	–	–	–	–	–	–
Panasonic 4400/5400	–	–	49	69	–	–	119	–	–	–	–	–
Panasonic 4440, 5410	–	–	69	–	–	–	109	–	–	–	–	–
Panasonic 6500	–	–	14	29	–	–	79	–	–	–	–	–
Sharp 9400, 9460, 9600, 9700E	–	–	49	69	–	–	119	–	–	–	–	–
Sharp 9500, E, H, 9700, H	–	–	49	–	–	–	99	–	–	–	–	–
TI Microlaser Pro E, Powerpro, Pro 600	–	–	39	49	–	–	59	–	–	99	–	–
TI Microwriter	–	–	39	69	–	–	–	–	–	–	–	–

AST MEMORY

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Advantage Adventure 4000	4Meg/16Meg	39/124
Advantage Adventure 6000	4Meg/8Meg/16Meg/32Meg/64Meg	39/78/124/248/469
Advantage Adventure 8000	4Meg/8Meg/16Meg/32Meg	34/69/124/229
Advantage Pro 486 SX33, SX25	4Meg/8Meg/16Meg/32Meg	34/69/124/229
Bravo LC	4Meg/8Meg/16Meg/32Meg	34/69/124/229
Bravo LC 5100, 5133, 5166 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	39/69/144/249
Bravo MS	4Meg/8Meg/16Meg/32Meg	34/69/124/229
Bravo MS 5100, 133, 166 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	39/69/144/249
Bravo MS-T 6150 (pairs)	4Meg/8Meg/16Meg/32Meg	34/69/124/229
Manhattan G, V (pairs)	8Meg/16Meg/32Meg	69/129/239
Premmia 4/33, 4/50, MTE 433 (pairs)	4Meg/8Meg/16Meg/32Meg	39/69/129/239
Premmia 4/66D, SE 4/33, 4/66 (pairs)	4Meg/8Meg/16Meg/32Meg	39/69/129/239
Premmia LX P/60, MX 4/66, P75	4Meg/8Meg/16Meg/32Meg	34/59/119/219

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Ready 951D, 9520, 9522, 9530, 9532 (pairs)	4Meg/8Meg/16Meg/32Meg	29/59/109/199
Ready 7022 (EDO, pairs)	4Meg/8Meg/18Meg/32Meg	29/59/109/199
Image P60, P90, D, P100E (pairs)	4Meg/8Meg/16Meg/32Meg	29/59/109/199

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Vectra VA 6/180 6/200 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	39/69/99/199
Vectra VE2 5/75 – 5/133 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	39/69/99/199
Vectra XA 6/180, 6/200 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	39/69/99/199
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Compaq Aero, 400, 410, 420, 430	109	Sharp 8700, 8800, 8900	160
Compaq LTe 5000 Series	109	TI Exstensa 450, 455, 510, 515	139
Epson Action Note 650, 660	162	TI Exstensa 550, 555, 560, 570	149
Epson Action Note 800, 866, 880, 910	154	TI Exstensa 800, 605, 650	181
IBM Thinkpad 355, 360	92	Toshiba 600, 810	Call
IBM Thinkpad 365 C, ED, XD	92	Toshiba 400, 405, 410, 415, 420, 425, 430	193
IBM Thinkpad 701	92	Toshiba 100, 105, 110, 115, 200, 205	89
IBM Thinkpad 750, 755	159	Toshiba 2100 Series	89
IBM Thinkpad 755 CD, CE, CV, CX	159	Toshiba 2400, 2450, 1900, 1950, 1960	109
NEC Versa 2000, 2200, 2205	Call	Toshiba 4700, 4800, 4850, 4900	109
NEC Versa E, V	118	Toshiba T4500, T4600	139

TOSHIBA LAPTOP MEMORY

MODEL	AMT. UPGRADED	PRICE
Tecra 500/P650	*8Meg/16Meg/32Meg/48Meg/128Meg*	*79/129/249/349*
Tecra 700 (SDRAM)	*8Meg/16Meg/32Meg*	*79/139/299*
Tecra 710, 720	*8Meg/16Meg/32Meg/64Meg/128Meg*	*69/129/299/1929/2049*
T2000SXE/2200SX/T1800, 1850, C	8Meg	94.00
T2100, 2105, 2150, 2155, 2110, 2115	4Meg/8Meg/16Meg/24 Meg	49/69/139/199
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	4Meg	39.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	8Meg	79.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	16Meg/32Meg	139/279
T3400CT, T2400, T3600	4Meg/8Meg/16Meg/24Meg	59/79/149/199
T100, 105, 110, 115, 205, 210	*8Meg/16Meg/32Meg*	*69/129/299*
T400, 405, 410, 415, 420, 425, 430	*8Meg/16Meg/32Meg*	*69/129/209*
T400CS, 400CDT, T100, 105 Edo	*8Meg/16Meg/32Meg*	*69/129/299*
T600, 610, CT Edo, 660	8Meg/16Meg/32Meg	69/129/209

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT. UPGRADED	PRICE
ACERNote 730C, 735C, 760C, 760CX, 780CX	2Meg/4Meg/8Meg	39/59/89
ACERNote 763, 765, 782, 784, 786	4Meg/8Meg/16Meg	59/79/139
ACERNote Light 350, 352, 355	4Meg/8Meg/16Meg	59/79/139
ACERNote Light 356, 358, 359, 361 (pairs)	4Meg/8Meg/16Meg	59/79/139
ACERNote Nuovo 971, 972	*8Meg/16Meg/32Meg*	*69/125/239*
ACERNote Pro 950, 954, 955, 957, 959 (pairs)	4Meg/8Meg/16Meg	59/79/139
Ambra N Series	*4Meg/8Meg/12Meg/16 Meg*	*89/109/139/169*
Ambra SN Series	4Meg/16 Meg	79/179
Ambra N-75, N-100	4Meg/8/16	49/79/139
AST Ascentia A Series	*8Meg/16Meg/32Meg/64Meg*	*75/139/269*
AST Ascentia P30, P50	*8Meg/16Meg/32Meg*	*69/169/399*
AST Ascentia J10, J30, J50	*8Meg/16Meg/32Meg/40Meg Kit*	*79/159/399/359*
AST Ascentia 900N, 800N, 810, 910	8Meg/16Meg	79/119
AST Ascentia 950	8Meg/16Meg	79/119
AST Bravo & Explorer	*4Meg/16Meg*	*79/219*
AST Notebook Prem Exec 386SX/20/25/25L	4Meg	69.00
AST Power Exec 3/25C, 425EL, 425SL	4Meg/16Meg	69/139
AST Power Exec 4/33SL	4Meg/16Meg	69/139
AT&T Globalyst 130, 200, 250	4Meg/8Meg/16Meg	69/99/149
Austin DX4, DX2, SX2, SX Series	4Meg/16Meg	69/189
Austin Edge	*6Meg/16Meg*	*89/149*
Austin Edge Duet	*16Meg/32Meg*	*199/399*
Austin Vista	*4Meg/8Meg/16Meg/24Meg*	*69/99/219/349*
Canon 1100	4Meg/8Meg/16Meg	Call
Canon Innova Book 150, 175	4Meg/16Meg	59/139
Canon Innova Book 200LS	4Meg/8Meg/16Meg/24Meg	69/99/219/349
Canon Innova Book 350CD, 360, 475	*8Meg/16Meg*	*69/139*
Canon Innova Book 480, 490	*8Meg/16Meg*	*89/149*
CTX EZ Book 5x86 Pent. Series	*4Meg/8Meg/16Meg*	*59/89/139*
DEC HiNote, Ultra HiNote	4Meg/8Meg/16Meg	59/89/139
DEC HiNote Ultra, Ultra II	*4Meg/8Meg/16Meg*	*59/89/139*
DEC HiNote VP 529, 525, 535	*8Meg/16Meg/32Meg*	*69/139/269*
DEC HiNote VP 5199, 5120	*8Meg/16Meg/32Meg/64Meg*	*69/179/399/599*
DEC HiNote VP	*8Meg/16Meg/32Meg*	*79/139/269*
Dell Latitude LM (pairs)	*4Meg/8Meg/16Meg*	*69/99/169*
Dell Latitude 433, C, CX	4Meg/16Meg	69/149
Dell Latitude LMP (pairs)	4Meg/8Meg/16Meg	59/89/139
Dell Latitude LX, M	4Meg/8Meg/16Meg	59/89/139
Dell Latitude XP, XPi	4 Meg/8Meg/16Meg	59/89/139
Epson ActionNote 650, 650c, 660c, 660cx	4Meg/8Meg/16Meg	39/79/139
Epson ActionNote 700, 700c, 700cx	4Meg/16Meg	69/149
Epson ActionNote 880, 866c, 890	4Meg/8Meg/16Meg/20Meg	59/89/159/199
Epson ActionNote 4LC/25, 4LC/33, 4SLC/2-50, 4000	6Meg	69.00
Fujitsu Monte Carlo, Montego, Milan	*8Meg/16Meg/32Meg*	*69/139/269*
Gateway 2000 Colorbook 4/33	4Meg/16Meg	69/179
Gateway 2000 Nomad 425 DXL/SXL	4Meg/16Meg	140/559
Gateway 2000 486 Handbook or Liberty	4Meg/16Meg	49/139
Gateway 2000 Solo Series	4Meg/8Meg/16Meg	69/89/139
Gateway 2100 Solo Series	8Meg/16Meg	119/209
Hitachi C-Series	*8Meg/16Meg/32Meg*	*79/149/319*
Hitachi E-Series	*8Meg/16Meg/32Meg*	*79/139/269*
Hitachi M-Series	*6Meg/16Meg/32Meg*	*79/129/269*
HP Omnibook 300, 480, 425	2Meg/4Meg	83/129
HP Omnibook 530, 600	4Meg/8Meg/12Meg	49/69/99
HP Omnibook 800	8Meg/16Meg/32Meg	79/119/209
HP Omnibook 4000	4Meg/8Meg/16Meg	69/89/169
HP Omnibook 5000, 5500	8Meg/16Meg/32Meg	69/119/219
Leading Edge Aviva 2000	4Meg/16Meg	59/139
Lexmark SE10	4Meg/8Meg	69/99
Micron Transport Pentium (pairs)	8Meg/16Meg	89/189
Midwest Micro Elite or Soundbook	4Meg/8Meg/16Meg	69/99/149
Midwest Micro Elite or Soundbook Plus or Sndbk II, IIP	4Meg/8Meg/16Meg	69/99/149
Midwest Micro Elite or Soundbook CD	4Meg/8Meg/16Meg	69/99/149
NEC Ultralite Versa, E, V, MP	4 Meg/8Meg/16Meg/20Meg	64/99/199/299
NEC Versa S, Versa 2000C & 20000, 500	4Meg/8Meg/16Meg	49/79/139
NEC Versa 4000, 4050/4080	4Meg/8Meg/16Meg/32Meg	59/79/139/299
NEC Versa 6000	*6Meg/16Meg/32Meg*	*109/169/299*
Olivetti Echos P75-P1335 (pairs)	4Meg/8Meg/16Meg	89/129/219
Packard Bell Statesman	2Meg/8Meg	49/99
Panasonic CF-V21P, CF-580	4Meg/16Meg	69/169
Panasonic CF-V41	4Meg/8Meg/16Meg/32Meg	49/69/139/289
Sager Midern, all models	*4Meg/8Meg/16Meg/32Meg*	*89/99/169/399*
Samsung Sens 810	8Meg/16Meg	79/139
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Sharp 8700, 8800, 8900	4Meg/8Meg/16Meg	49/69/139
Sharp 3010, 3020, 3050, 3060	4Meg/8Meg/16Meg/32Meg	49/69/139/399
Sharp 9000, 9030	8Meg/16Meg/32Meg	79/189/399
Sharp 9040, 9070 (pairs)	4Meg/8Meg/16Meg/32Meg	49/99/149/525
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Sharp PC 100T	8Meg/16Meg/32Meg	89/159/299
TI 4000, TI 4000E, TI 4000M	4Meg/16Meg	140/559
TI 5000, 5100, 5200, 5300	*6Meg/16Meg*	*79/149*
TI 6020, 6030	*8Meg/16Meg/32Meg*	*89/159/711*
TI Extensa, 450, 450T, 455, 455T	4Meg/8Meg/16Meg	49/79/139
TI Extensa, 550, 555, 560, 565, 570 (pairs)	*4Meg/8Meg/16Meg*	*49/69/169*
Twinhead, Altima, Compudyne, 486SX, DX, Tandy 4860	4Meg/16Meg	79/189
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Zenith Z-Note MX	4Meg/8Meg/16Meg	69/99/179
Zenith Z-Star 4/33	2Meg/8Meg	49/99
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S-RAM Cards 2MEG/4MEG	189/469	8X CD Rom	399
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Readwriter Card (ISA Slot)	149	Multimedia Combo, Sound/SCSI	499
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1.6 GIG		239	2.5 GIG	309
2.0 GIG		276	3.1 GIG	349

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THINKPAD 355, 360, 370, 750, 755 – 1.08 GIG $465; 1 3 GIG 573; 2 1 GIG 819
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COMPAQ
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NEC
Versa E, V, M, P – 1.3 GIG $552; 2 1 GIG 799
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• CD ROM DRIVES •

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SCSI					
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NEC	8X	CDR1410	145ms	$205	$295
Plextor	8X	PX83CS	115ms	$299	$389
Plextor	12X	PX12TS	105ms	$319	$409
Toshiba	12X	XM5701B	115ms	$199	$289
Plextor	12X	PX12CS	105ms	$349	$439
Toshiba	15X	XM3801B	99ms	$259	$349
ATAPI IDE				**Int**	**Int kit**
NEC	8X	CDR1400	140ms	$110	$140
Mitsumi	8X	CRMCFX800	150ms	$110	$140
Acer	10X	AC910A	150ms	$125	$155
Lite On	12X	LTN126A	155ms	$129	$159
Acer	12X	AC612A	125ms	$135	$165
Toshiba	12X	XM5702B	115ms	$159	$189
Teac	12X	CD512A	160ms	$145	$175
Cyber	12X	CY8ER12X	150ms	$115	$145
Mitsumi	12X	CRMCFX12X	150ms	$139	$169
NEC	12/16X	CDR1600	100ms	$175	$205

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NEC	4X	CDR4X4	4 Disk	250ms	$99
Panasonic	10X	SQTC510N	5 Disk	130ms	$249

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Nakamichi	8X	MJ48S	4 Disk	150ms	$299

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800M8	Seagate	TST800R	$129
3.2Gig	Seagate	TST3200RFT	$199

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800MB	Seagate	TST800RPT	$159
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4-8G8	Seagate	TST8000(A)	$349

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2G8	Hewlett Packard	C1534AI	$609
2-4GB	Seagate	C4324RP	$679
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4-8GB	Seagate	C4326NP (DDS2)	$859
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48-96G8	Seagate	C45B6NP 12 tape autoloader	$2399

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3.5-7G8	Exa8yte	EXB8205XL	$1269
7-14GB	Exa8yte	EXB8505XL	$1889
7-14GB	Exa8yte	EXB8700LT	$1029
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1200M8	10ms	5400	Fujitsu	M1636T	3	$189
1200MB	14ms	4103	JTS	JTS1200	3	$179
1275MB	12ms	4500	Seagate	ST31276A	3	$195
1280M8	11ms	4500	Quantum	TM31280A	3	$195
1281MB	11ms	5200	Western Digital	WDAC21200	3	$199
1624M8	10ms	5200	Western Digital	WDAC21600	3	$219
1670M8	11ms	4480	Maxtor	M81750A	3	$215
1700MB	10ms	5400	Fujitsu	M1623T	3	$209
1700MB	12ms	4500	Seagate	ST31720A	3	$215
2000MB	14ms	4103	JTS	JTS2000	3	$219
2004M8	11ms	4480	Maxtor	M72004A	3	$255
2100MB	11ms	5200	Western Digital	WDAC22100	3	$239
2100MB	9ms	5400	Fujitsu	M1624T	3	$235
2132M8	12.5ms	4500	Seagate	ST32132A	3	$247
2168M8	10.5ms	4500	Quantum	TM32160A	3	$249
2500MB	**9ms**	**5400**	**Fujitsu**	**M1638T**	**3**	**$249**
2550M8	15ms	3600	Quantum	8F2500A	3	$229
2550MB	10.5ms	4500	Quantum	TM32550A	3	$262
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2700M8	12ms	4480	Maxtor	M72700A	3	$269
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3254M8	10.5ms	4500	Quantum	TM33200A	3	$292
3500M8	12ms	4480	Maxtor	M83500A	3	$365
3840MB	10.5ms	4500	Quantum	TM33840A	3	$333
4000MB	12ms	5200	Western Digital	WDAC34000	3	$389

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SCSI	Speed	RPM	Brand	Model	Wty	Int	Ext
1050MB	9ms	5400	Seagate	ST31055N	3	$339	$409
1280MB	12ms	4500	Quantum	TM3128OS	3	$279	$349
2110MB	10.5ms	4500	Quantum	TM32110S	3	$329	$399
2150MB	9ms	5400	Seagate	ST32155N	5	$475	$545
2150MB	8ms	7200	Seagate	ST32171N	5	$699	$769
3254MB	10.5ms	4500	Quantum	TM33200S	3	$379	$449
4350MB	8ms	7200	Seagate	ST34371N	5	$1089	$1159
4400MB	8ms	7200	Fujitsu	M2954S	5	$819	$889
4550MB	8ms	7200	Quantum	XP34550S	5	$939	$1009
4550MB	7.9ms	7200	Micropolis	MC4345	5	$959	$1029
4550MB	**7.5ms**	**10,000**	**Seagate**	**ST34501N**	**5**	**$1669**	**$1739**
4550MB	7.9ms	7200	Micropolis	MC4345AV	5	$1129	$1199
9091MB	8.5ms	7200	Micropolis	MC3391	5	$1689	$1789
9091MB	8.5ms	7200	Micropolis	MC3391AV	5	$1899	$1999
9100MB	9ms	7200	Seagate	ST19171N	5	$2099	$2199
9100MB	8ms	7200	Quantum	XP39100S	5	$1539	$1639
9100MB	10ms	7200	Fujitsu	M2949S	5	$1549	$1649
9100MB	**8ms**	**10,000**	**Seagate**	**ST19101N**	**5**	**$3569**	**$3669**
23.3GB	**13ms**	**5400**	**Seagate**	**ST4234501N**	**5**	**$4029**	**$4129**
WIDE SCSI							
1050MB	9ms	5400	Seagate	ST31055W	5	$389	$529
2150MB	9ms	5400	Seagate	ST32155W	5	$519	$659
2150MB	8ms	7200	Seagate	ST32171W	5	$779	$919
4294MB	8ms	7200	Micropolis	MC3243W	5	$899	$1039
4294MB	8ms	7200	Micropolis	MC3243WAV	5	$999	$1139
4350MB	8ms	7200	Seagate	ST34371W	5	$1189	$1329
4400MB	8ms	7200	Fujitsu	M2954W	5	$869	$1009
4550MB	7.9ms	7200	Micropolis	MC4345W	5	$999	$1139
4550MB	7.9ms	7200	Micropolis	MC4345WAV	5	$1159	$1299
4550MB	**7.5ms**	**10,000**	**Seagate**	**ST34501W**	**5**	**$1699**	**$1839**
4550MB	8ms	7200	Quantum	XP34550W	5	$979	$1119
9091MB	8.5ms	7200	Micropolis	MC3391W	5	$1739	$1879
9091MB	8.5ms	7200	Micropolis	MC3391WAV	5	$1939	$2079
9100MB	8ms	7200	Quantum	XP39100W	5	$1599	$1739
9100MB	8ms	7200	Fujitsu	M2949W	5	$1579	$1719
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9100MB	**8ms**	**10,000**	**Seagate**	**ST19101W**	**5**	**$3599**	**$3739**
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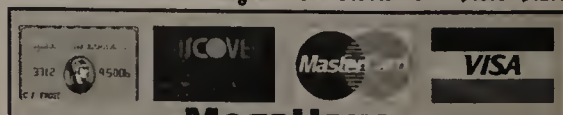

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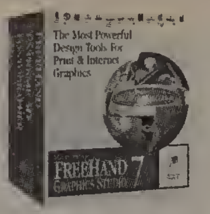

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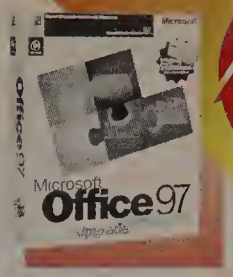

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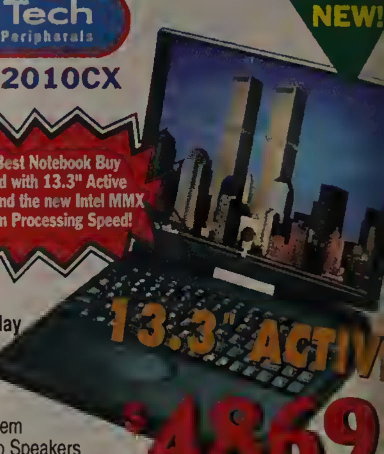

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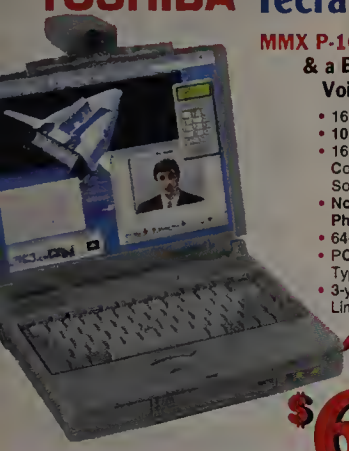

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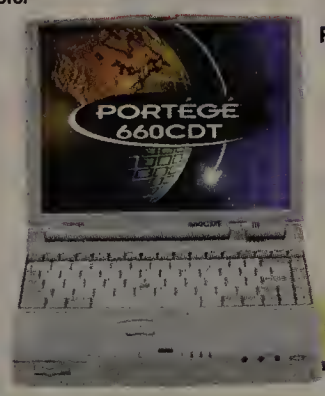

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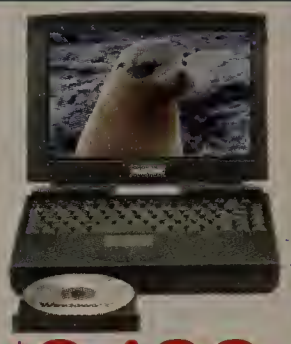

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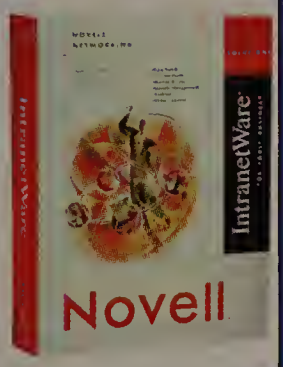

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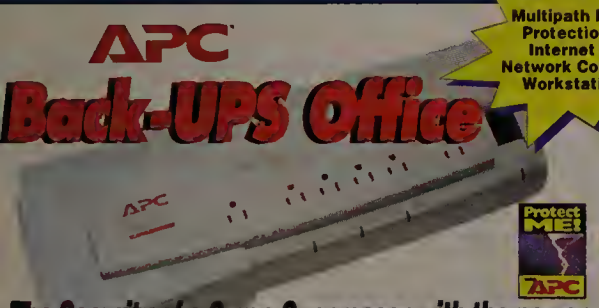

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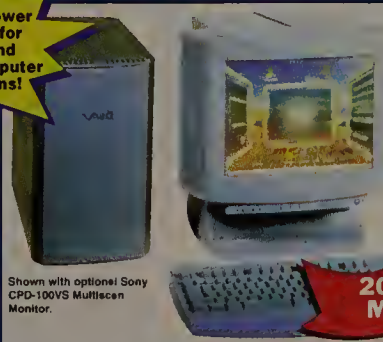

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36746	E-P133 DC	Pent./133	Dual/11.3"	1.0GB	16/40MB	–	1699
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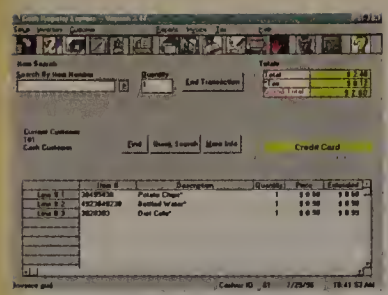

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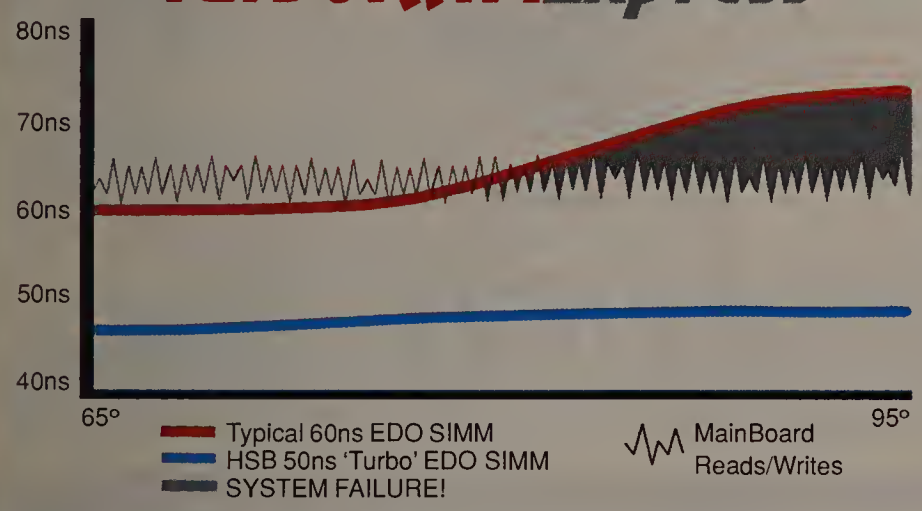

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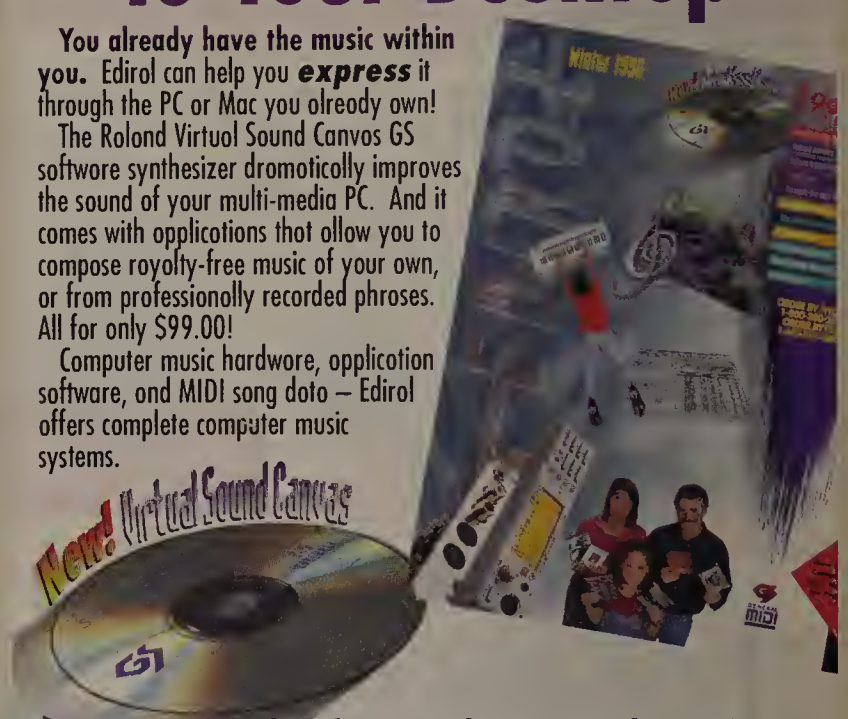

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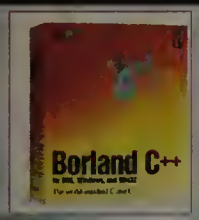

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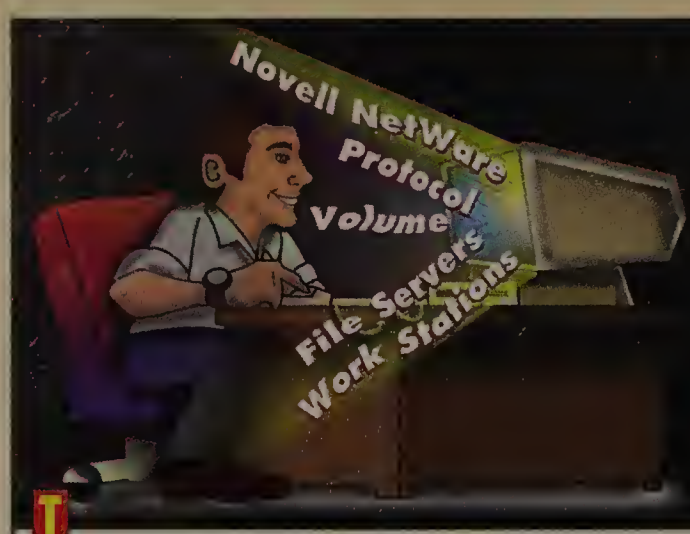

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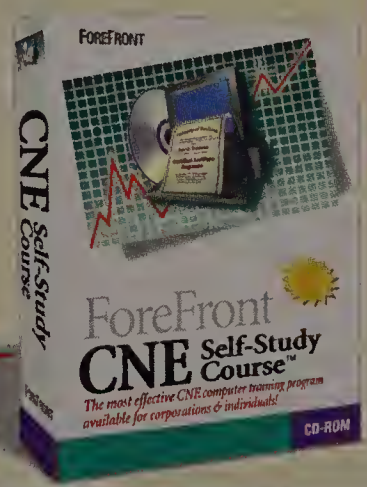

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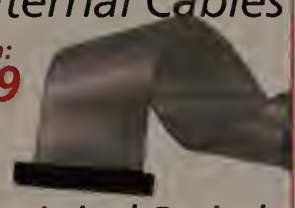

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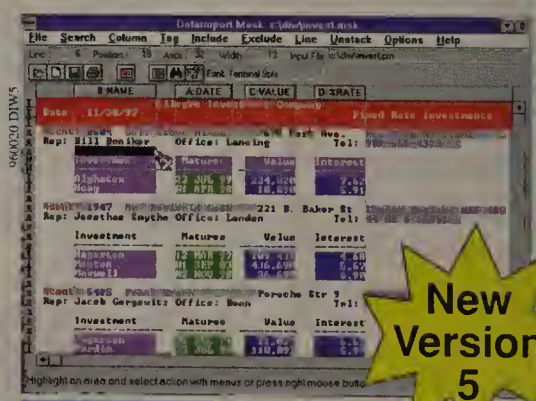

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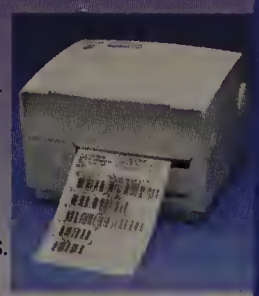

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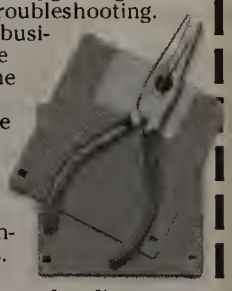

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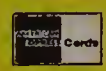

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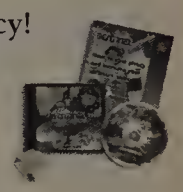

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501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

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Editorial Features (see article for numbers)

901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920

Advertised Products

951 Desktop computers	955 Accounting software	959 Multimedia products
952 Notebook computers	956 Graphics software	960 Utilities
953 Windows 95 software	957 Network/sharing products	961 Mail order companies
954 Monitors and video boards	958 Printers	962 Storage devices

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960 Utilities
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962 Storage devices

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The best things online might be free. We've uncovered scores of the best online sources of free products and services for computers, business, and fun. From little-known Windows shortcuts to search engines that offer small-business advice, the price is always right for these freebies.

THE NEW NETSCAPE COMMUNICATOR

With the introduction of Communicator, Netscape busts out of the browser market with a product that creates an environment for all-around computing. Plus a sneak peek at the next release of Microsoft's Internet Explorer.

PDAS: A PC IN YOUR POCKET?

PC World editors Harry McCracken and Michael S. Lasky offer their Siskel-Ebert takes on eight palmtop PCs and assess whether any of the pocket-size contenders make Windows CE worth watching.

SPECIAL REPORT: ONLINE SCAMS

Get-rich-quick offers, miracle cures for a small fee, pyramid schemes that promise easy money—the Internet is fertile ground for con artists. Here's how to spot and avoid online scams.

ALSO NEXT MONTH

▶ **PC World Top 100:** Updated monthly, this is the best buyers guide to PCs and peripherals. Check out the Top Power Desktops, Budget Desktops, and Notebooks and the Top Workgroup Printers, 19-Inch Monitors, Graphics Boards, and External and PC Card Modems.

▶ **Which CPU is the Right One for You?:** Intel, AMD, or Cyrix? Pentium or Pentium Pro? MMX now or later? The array of new CPUs is dizzying, and even more choices are on the way. Here's a guide to what works best for whom.

▶ **Here's How:** Upgrade Guide to converting from Windows 95 to NT 4.0—it's not as simple as you might think.

PC WORLD

PC MAGAZINE EDITORS' CHOICE™
March 4, 1997

When it comes to scanners, not all 800 pound gorillas are what they're cracked up to be.

If you need a scanner that combines high performance and maximum value, may we suggest a little head-to-head competition. UMAX vs HP? Unfair comparison? Maybe for them. UMAX has a reputation for offering advanced, award-winning scanners at prices that make good business sense. Plus, our software bundles are unmatched, even by the big boys. So why monkey around? Compare the UMAX S-12 with the HP ScanJet 4c and decide for yourself.

Compare	UMAX S-12	HP ScanJet 4c
Image editing software	✔ Adobe Photoshop Full	Photopaint
Presentation software	✔ ASAP Word Power	None
Max. software enhanced resolution	✔ 9600	2400
Bit depth	✔ 33-bit[1]	30-bit
Scanning speed (5" x 7" color photo)	✔ 18 sec.	42 sec.
Scanning lamp	✔ Cold cathode - lasts longer	Fluorescent
Tech support	✔ Toll free	No 800 number
Est. street price	✔ $649[2]	$ 847[3]

UMAX S-12

UMAX

HP ScanJet 4c

toll free **800-859-2728**

http://www.umax.com

[1] 33-bit equivalent with the analog gamma correction. [2] Estimated street price as of March 1, 1997. S-12 prices vary from $499-$649 based on software bundles. [3] Average street price from sampled advertisements in Computer Shopper February, 1997

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40. "Uurrrrpp!"
41. Low Flying Sidewinders.
42. Strafing From The Air.
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44. Standard Issue M-16's.
45. The Sharpening Of Bayonets.
46. The Hiss Of Mustard Gas.
47. A Declaration Of Peace.
48. Rain.
49. Howitzers.
50. The Cheer Of Victory.
51. Quiet.
52. The Low Rumble Of Bombs In The Distance.
53. The Squawk Of A Radio Call For Help.
54. Com chatter.
55. "Surrender Now!"
56. Troops Marching.
57. Jungle Animals.
58. "The Biscuits In The Army, They Say Are Mighty Fine."
59. The Angry Croak Of Your Commander.
60. A Tropical Storm.
61. A Blazing Oil Well Fire.
62. Unrolling Adhesive Bandages.
63. "Ugh!"
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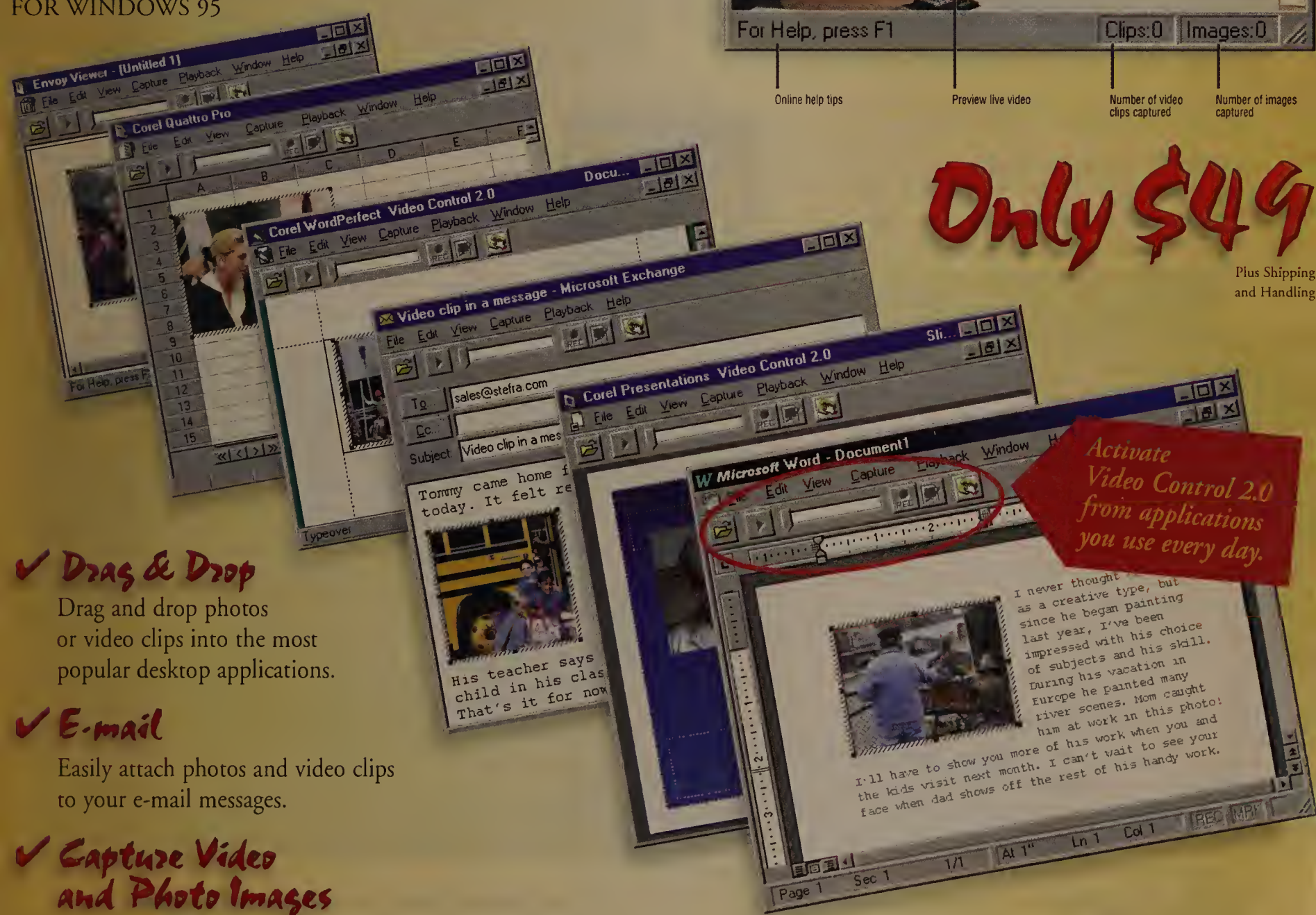

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Warning: Your PC May Be Incompatible

POP QUIZ: SOMEBODY HAS GIVEN YOU a compact disc. Will your computer be able to play it? Or say you've received a file with a .doc extension. Will your word processor be able to read it? Answer: Who knows? Compatibility certainly exists in the world of personal computers, but as long as there breathes an engineer with a "better" idea, incompatibilities will thrive.

This isn't the way it works in the world of consumer electronics. A music CD will play in virtually every CD player ever made. A 45-year-old black-and-white TV can still pick up signals from local VHF stations. But play an enhanced CD's videos or music on my 2-year-old CD-ROM drive? Fahgeddaboutit!

It's not just that things don't always work together—there's also no easy way to figure out whether they will. Take Word 97, which creates .doc files no previous version of Word can handle. If you use Word 95 and get an e-mail attachment called report.doc, how do you know if you can read it? Only from bitter experience.

This has been going on for years: A quick scroll through the Save As dialog in WordPerfect 7 reveals more than 75 file formats, many of them ancient. Several even use the .doc extension that Word now claims as its own.

As long as there breathes an **engineer** with a "better" idea, **incompatibilities** will **thrive.**

SLIPPED DISCS

HARDWARE'S HARDLY BETTER. Figuring what discs will play on a given CD-ROM drive is a hit-or-miss proposition. Photo CDs require multisession drives. Enhanced CDs demand multisession capability *and* firmware that supports the Enhanced CD quasi-standard. Most new drives have it; many old ones don't.

Most standard CD-ROM drives can read the recordable CD-Rs, which makes them a handy medium for exchanging big chunks of data. But no CD-ROM drive made before 1997 will be able to read the forthcoming rewritable CD-RWs. For that you'll need a multiread drive that is also multisession and multispin. Got that?

You might think the forthcoming DVD-ROM players would do the trick, since they can read CDs, CD-ROMs, and even CD-RWs. Guess what? Most early models will not read CD-Rs. Even more surprising, they won't read the promising high-density rewritable disks called DVD-RAM when they finally arrive.

The DVD solution is simple, but it means adding extra parts to the drives at extra expense. Most manufacturers would rather deliver low price than universal compatibility.

One conspiracy theorist, who masquerades as an editor at this publication, suspects incompatibilities are foisted upon us to make us buy new products. I prefer to blame laziness. Developing new features is simpler if you don't have to worry about syncing up with the old ones, and harried engineers and programmers, like the rest of us, sometimes take the easy way out.

DOING THAT JAVA JIVE

STILL, A FEW THINGS really *are* better than they were in the good old days. Once upon a time, there were several wildly different display standards, and you could fry a monitor if you happened to plug it into the wrong card. Today overdriving a monitor is much less likely.

Printing is simpler than ever. In the DOS days, each program had a set of printers (and, if you were very lucky, fonts) that it supported. Windows moved most of those issues to the system. With few exceptions, if Windows is compatible with the printer, so are the applications.

Microprocessors and operating systems remain surprisingly compatible with their ancestors. I still use a 1984 shareware database developed for the IBM PC and DOS 2.0. It works fine on a Pentium and Windows 95. Maybe that's just because I actually paid the registration fee.

In theory, the compatibility headache may soon be behind us. Java and the World Wide Web offer the promise of new standards destined to bring more compatibility among programs and machines. But I'll bet a carload of coffee that before long, you'll see Java programs labeled "Windows 97, Pentium Pro processor, 64MB, DVD-ROM II drive required."

PC World *contributing editor Stephen Manes is a columnist for the* New York Times *and coauthor of* Gates: How Microsoft's Mogul Reinvented an Industry *(Touchstone/Simon & Schuster, 1994, 800/223-2348).* ■

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CAN YOU REALLY AFFORD TO BUY THE #2 NOTEBOOK?

ANNUAL GUIDE TO COMPUTERS

Laptops

TRAVELING COMPANIONS

Some Popular Pentium Notebooks

RATING	MFR/PRICE	MODEL/SCREEN	CONFIGURATION	COMMENTS
3.1	DELL COMPUTER $2999	Latitude LM P133ST, 12-in. TFT display, (133 Mhz)	6.8 lb 16MB RAM, 810MB disk, 6X CD-ROM	Great
2.8	IBM PC CO. $6999	ThinkPad 760ED 1, 2-in. TFT display (133 Mhz)	1.2GB disk, 4X	
2.8	WINBOOK COMPUTER $3999	WinBo 11.3 (		
2.7	COMPAQ COMPUTER $6398	L		
2.7	HEWLETT-PACKARD $6120			

– Business Week
11/4/96

What's wrong with this picture? The notebook that gives you the most performance, usability and features costs half the price of notebooks that give you less. (Notebooks, by the way, that you probably thought gave you more.) And remember, you have this information on the very best authority. *Business Week, the* business publication, in their Second Annual Computer Buying Guide cited the Dell Latitude LM P133ST as "the top ranked machine in the tests" and the notebook they'd most like to travel with. So if you're shopping for a notebook, buy the best. After all, you can afford it.

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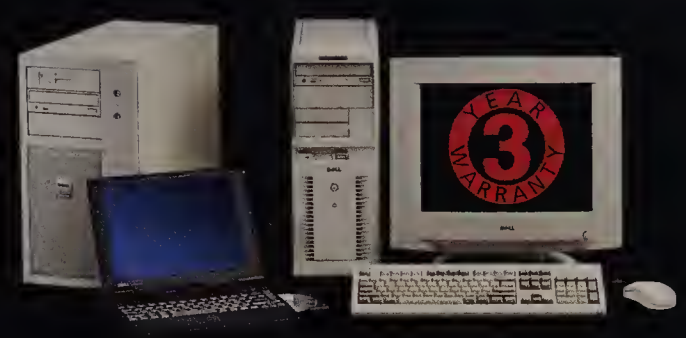

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